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PUBLIC HEARING

before

ASSEMBLY ENERGY AND NATURAL RESOURCES COMMITTEE

To discuss issues concerning impediments
to the growth of cogeneration in New Jersey

April 13, 1987
Office of the
Board of Public Utilities
Newark, New Jersey

MEMBER OF COMMITTEE PRESENT:

Assemblywoman Maureen B. Ogden, Chairwoman

ALSO PRESENT:

Raymond E. Cantor
Office of Legislative Services
Aide, Assembly Energy and Natural
Resources Committee

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ASSEMBLY ENERGY AND NATURAL RESOURCES COMMITTEE

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March 27, 1987

NOTICE OF A PUBLIC HEARING

The Assembly Energy and Natural Resources Committee will hold a public hearing on April 13, 1987, at 10:00 A.M. in the offices of the Board of Public Utilities, Room 208, 101 Commerce Street, Newark, New Jersey.

The purpose of the public hearing is to discuss issues concerning impediments to the growth of cogeneration in New Jersey.

Persons interested in testifying at the public hearing should contact Raymond Cantor, Committee Aide, at (609) 292-7676, and should submit written comments at or before the public hearing.



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ASSEMBLYWOMAN MAUREEN B. OGDEN (Chairwoman): We would like to get started at this time. I'm Assemblywoman Maureen Ogden, Chairwoman of the Assembly Energy and Natural Resources Committee. Obviously, I'm the only one here at this point. We do have other members of this Committee. I know that one is in China, and obviously won't be here. I'm hopeful that some of the other members will be here for part of the hearing.

I know there are a lot of you who have signed up to speak who have told me that you have deadlines — you need to speak by 11 o'clock or by noontime. We'd like to honor that request to the extent that we are able to. I should say that this is a public hearing and a verbatim recording will be taken of all the people who speak. In addition, anyone who has to leave, if you would like to submit your statement in writing or-- How long will the hearing be held open for anyone who doesn't have a written statement?

MR. CANTOR (Committee Aide): For as long as we want.

ASSEMBLYWOMAN OGDEN: We can certainly hold it open afterwards for 10 days, or whatever suits everyone's schedule, for those who -- I think 10 days is appropriate -- have to leave and are not able to leave a written statement; also for anyone who wishes to give an oral statement; and also for those who, after hearing some of the comments today, wish to send a written statement. As I say, we will keep it open.

All of these statements should be sent to Raymond Cantor, who is sitting to my left here, who is the Legislative Aide to the Committee. For those of you who may be attending your first hearing, we have a list here of people who have written to us and asked that they be permitted to speak.

What I shall do in running this hearing is go first to the written requests to speak -- taking those who are either government officials or elected officials -- and then for anyone else who wishes to speak, if you want to come up at any time and give your name, we will certainly be glad to have it,

or you can sign up over there. Or, when we've finished with those who have requested to be heard, I'll certainly ask if there is anyone else in the audience who wishes to speak at that time.

Now, just to give a little bit of background in connection with this hearing, as many of you are aware, I'm very interested in cogeneration. I've been the sponsor of two bills that have been signed into law. I guess it was, not last year, but the year before — 1985 — one to exempt from the sales tax all the components of a cogeneration facility; and the other one was, when natural gas is being used, to exempt that from the Gross Receipts and Franchise Tax.

So, I hope that these two bills have been a benefit to companies here in the State of New Jersey. I've heard from some that they have, and I hope for those who are thinking about cogeneration that these bills have helped to push them in that direction.

We are all aware of the many benefits that cogeneration supplies, particularly in a state like New Jersey where we have tremendously high energy costs. I think that New Jersey is about sixth in terms of that. The business studies that have been done show that New Jersey would be in an even better competitive position if we had lower energy costs.

Of course, it is one of the most efficient ways of using fuel. It clearly postpones the need — maybe forever — for new power plants; it decreases also our reliance on importing energy from the Midwest. So, all of those things are certainly very good.

I know many of you are here today dealing with the question of air emissions control. While I am a strong proponent of cogeneration, I also have an environmental background, so there has to be a balance, I believe, between economic benefits and the environmental benefits of cogeneration, as well as New Jersey continuing in its efforts to have clean air.

So, some of the questions I believe will be taken up today are state of the art -- what is the precise definition of that, cost verses environmental benefits, grandfathering, standards, the time of review for DEP, and the whole question of the SCR and its functioning when temperatures vary, switching fuels, and whether it actually has been used enough. I know that its use in this country, in California, has been fairly short. On the other hand, I understand that over in Japan it has been used for a number of years. So, it's a question for all of us as to whether the trials have been long enough to make that the state of the art.

In addition to that question, which I think is probably uppermost in everyone's mind-- I should say that this hearing is not just for that question, because when I first wanted to hold this hearing because, as I say, this has always been a great interest of mine, it was probably about two months ago, and it was thought that clearly this issue would be decided before the two months were up. Therefore, I never anticipated that this hearing would deal only with the air emission question.

I'm also interested in what people have to say about the buy-back rate, particularly the need for greater consideration of avoided costs, the question of self-wheeling, and probably last of all, if we're going to be depending upon cogeneration to a much greater extent -- the reliability of it, in terms of providing electricity. I know this is one of the key issues that the utilities present, saying that they are always there and they will always provide the service.

Today, I believe they are being planned, or actually permits have been applied for 2000 megawatts of cogeneration, which is a tremendous increase from what was even projected a short time ago by the Department of Energy. It's almost the equivalent of two Hope Creeks. If we are going to increasingly go in that direction, I think the question of how much we can

count on cogeneration when the need arises is something that needs to be dealt with.

So, just giving that brief kind of overview of where I hope this hearing will go today, I would like to first ask-- Did I see the Commissioner of Commerce here -- Mr. Blekicki? Did I see him just come in? Oh, there you are, Henry. I'd like you to present your statement, please, on behalf of the Department of Commerce and Economic Development.

A S S T. C O M M. H E N R Y T. B L E K I C K I: Good morning. Thank you for holding these hearings on cogeneration in New Jersey and the barriers which inhibit its full cost-effective utilization.

As you know, the Department of Commerce and Economic Development now includes the Division of Energy Planning and Conservation from the Department of Energy. The Department of Commerce fully embraces and subscribes to the policies on energy in general, and cogeneration in particular, set forth in the 1985 State Energy Master Plan. This plan, as you know, is intended to govern all energy-related decisions by State government "to the maximum extent practicable and feasible."

Cogeneration has a great future in New Jersey. New Jersey's great future will be realized, in part, because of cogeneration. With heavy industry a strong part of the economy, and a commercial sector growing rapidly, cogeneration can play a pivotal role. It lowers costs for older industries -- and even generates new income -- thereby helping them to compete in a worldwide marketplace. Doing so saves blue-collar jobs from the effects of foreign competition, even as our State rapidly shifts toward a service economy. Cogeneration can also be installed in new offices, hotels, research centers, and other facilities not normally thought of as locations for power production.

The potential scope of cogeneration is enormous. In 1986 alone, the Federal Energy Regulatory Commission received

applications for certification of over 2000 megawatts of cogeneration to be located in the State of New Jersey. That comes to twice the size of the recently completed Hope Creek nuclear power plant. But, unlike Hope Creek and other large, central station power plants operated by electric utilities, cogeneration comes in all sizes. Micro-facilities are being tested on individual homes; other units will power oil refineries and pharmaceutical plants. In addition, they are sited where people live and use energy, unlike distant utility plants connected by transmission lines. This cuts down on the risk of sudden disruptions in the system, such as the blackouts that twice rocked New York City.

Cogeneration differs from utility plants in other basic ways. For starters, it is inherently more efficient and collectively more reliable than its utility counterparts. Cogenerators regularly achieve higher overall efficiencies compared to utility plants. They do so by the burning of one fuel to meet two uses -- electricity and high-quality steam or heat for industrial processes, or to heat and cool a large structure. Moreover, nuclear plants achieve capacity factors -- a measure of reliability -- of between 50% and 60%. Cogenerators exceed 90% in system reliability.

Also, because cogeneration comes in small increments -- typically less than 10 megawatts -- the risk of outages is low compared to the risks of a few large power plants leaving the system at the same time, as occurred three summers ago in New Jersey. Such a massive loss is nearly impossible with dozens of cogenerators scattered throughout the region; diversity is part of their strength in the electric supply system.

An additional benefit to cogeneration is low cost compared to many new and existing utility facilities. Hope Creek, for example, with its total price of \$4.5 billion, will cost consumers about 18 cents per kilowatt hour, compared to an

average price for cogenerated power of about 6 cents, and average retail rates of about 10 cents. Many older power plants in the State also cost far more to operate than cogenerators are able to receive in contracts from the utilities which own these other, more expensive facilities.

Competition from cogeneration can lower electric rates for everyone and, in fact, cogeneration rates may be a yardstick for what constitutes just and reasonable rates for all facilities, whoever owns them. Cogeneration also substitutes for building new utility power plants which may cost far more than a comparable amount of independent power production and without the risk of costs being spread to the public if the facilities fail to reach completion.

Finally, the more cogeneration we have, the better is our air quality. Because of its innate efficiencies, cogeneration can cut down on the total levels of various pollutants emanating from within the factory gates at industrial facilities. These industries employ large, single-purpose boilers to burn fossil fuels for the production of steam. Before installing cogeneration, they also rely on utilities for their electricity. This power relies, in turn, on many fossil-fueled fired generating stations -- including coal-burning power plants to the West, which transport their pollution on the prevailing easterly winds, along with the electric current.

But, since cogeneration substitutes both for the on-site thermal needs of the host facility and for the electricity produced and sold by the utility, economic and energy benefits are joined with drastically reduced air pollution in most forms. In short, cogeneration is the logical hub of any plan for stimulating the economy, saving industrial jobs, assuring low-cost energy security, and protecting the health of all citizens.

With all this going for it, we might expect that cogeneration is flourishing in the State. Well, we are very hopeful that the potential for cogeneration in the State, as measured by the more than 2000 megawatts of cogeneration currently planned, will be realized. However, there are certain regulatory and economic issues which have to be dealt with in order for promises to be actualized. As will be seen, the barriers to enjoying the many benefits sketched out above tend to be mutually reinforcing. Thus if cogenerators are forced to install very expensive air pollution devices which provide only marginal benefit, it may force a cogenerator to cancel a project, unless the Board of Public Utilities allows these higher investment and operating costs to be passed on through higher utility buy-back rates. But this higher cost for cogenerated power will make it less competitive when compared to the rates paid by the utilities for power from the PJM grid. Thus, any consideration of these barriers must begin by recognizing that it may not be enough to remove one problem unless another is also addressed.

At any rate, after this somewhat lengthy introduction, I will now turn to the key issues currently affecting cogeneration.

Regulatory: Before a cogenerator begins construction or operation, it must receive a host of permits from State agencies. The Department of Environmental Protection is the main agency, as it is for other industrial activities. A current area of concern is in air pollution, where the Division of Environmental Quality has jurisdiction over permits to install and operate pollution control equipment under the 1967 Air Pollution Control Act, which remains little changed since its day as the first, comprehensive air pollution code in the nation.

Specifically, the Division must make a finding that the applicant will employ the state of the art in air pollution

control for each key pollutant emitted by the facility. This requirement is in addition to all others for the facility, including a finding that it complies with all requirements of the Federal Clean Air Act.

How does the Division make its decision on what constitutes state-of-the-art? The cogeneration industry and representatives of this agency have been meeting with the Division to try to resolve this issue. We are hopeful that some amicable solution may be achieved.

Generally, the discussions revolve around these questions:

1) Demonstrated feasibility: To what extent must the Division rely on the experience of usage of some control measure before it elects to impose it on cogenerators?

2) Cost: To what extent must the Division take into account the economic impacts of its decisions?

3) Environmental consequences: Should the Division be aware of the net environmental impacts of its decisions, including the net emission effects of installing cogeneration at industrial sites which then reduce their overall pollution levels?

4) Public participation: Before deciding on industry-wide and statewide standards, should the Division publish notice of its plans and hold hearings on them?

As a threshold matter, it is agreed by all parties that the Division has a duty to examine the demonstrated feasibility of any proposed pollution control device before it may impose it as state of the art. To date, the focus of this question has been on Selective Catalytic Reduction, a very costly, complex, and pioneering way to reduce emissions of nitrogen oxides, which are believed to be precursors to the generation of ozone.

Before going further, it may help to examine how the courts have interpreted the state-of-the-art requirement. In

Campbell vs. Sullivan, in 1972, a three-judge panel described the law as follows:

"The requirement that the 'advances to be satisfied' must be 'the latest' is overly broad. The legislation should be taken to have intended such advances in the art as have acquired some degree of current use and as are not unreasonably costly in light of the nature and utility of the industrial operation affected, as well as the harm which failure to use them would visit upon the environment."

Clearly, therefore, some degree of demonstrated feasibility is an element of state of the art. Moreover, once feasibility is found -- and substantiated -- then the relative costs and benefits of the device must be weighed carefully. And considering the nature and utility of the industry seems to us to also call for a net environmental and societal assessment. In brief, some cost-benefit analysis seems to be implicit in the definition set forth by the court.

Such a cost-benefit study, we are confident, would find that cogeneration using currently available control equipment -- mainly steam or water injection which efficiently reduces nitrogen oxides to very low levels -- should be the centerpiece of the State's efforts to abate total NO_x levels in the atmosphere.

As the accompanying graph reveals, one oil refinery seeking approval from the Department of Environmental Protection for the use of cogeneration with conventional control equipment, will cut two criteria pollutants solely due to cogeneration. Sulphur dioxide and oxides of nitrogen are reduced by 1250 and 300 tons per year, respectively. Meanwhile, the refinery lowers its costs of production and still has power left over to sell to the host utility.

If the Division develops a comprehensive NO_x control strategy for the State, we are confident that cogeneration will be looked upon as the Division's best ally. It is simply in

the nature of the process that cogeneration will replace existing, largely pre-1968 boilers and utility-power plants. All facilities antedating the air pollution control code, adopted pursuant to the 1967 statute, are grandfathered. This means they never have to apply for a permit or face a state-of-the-art review of any kind. Other than controls on the fuels they may use, these systems are largely unregulated. Therefore, we are working with the Division and the cogeneration industry to develop standards which will result in dramatically lower amounts of pollutants being released to the atmosphere through the substitution of cost-effective cogenerated power replacing the grandfathered facilities.

The danger facing cogeneration, as we see it, is that if netting analyses of environmental and economic impacts are not permitted, the focusing on abating the last possible amount of NO_x from a new cogenerator could well have a chilling effect on cogeneration investment in New Jersey. This would be a tragedy. Industries would find it more difficult to operate in New Jersey; our energy systems would suffer; ratepayers would pay more; and the air would be dirtier than it has to be. This cannot be in anyone's best interest.

The time required to perform state-of-the-art reviews is also troublesome. Because of the work load in the Division, we have been told that many applications are not reviewed as promptly as would be desirable. These delays seem counterproductive to the Division's mission. And, since cogeneration investors must compete with other investment opportunities, time lost is money lost, which can kill a project.

In the area of economic interest and taxation, when the Governor signed into law Chapter 117 -- in 1986 -- no one foresaw its consequences for cogeneration. The Act was designed to reverse a judicial decision which ruled that oil storage tanks of major oil companies are personal, not real

property -- effectively exempting them from local property taxes. The law of unintended consequences seems to have been at work. Local tax assessors, understandably eager to find new revenues, have looked upon some cogenerators as a major new revenue source.

N.J.S.A. 54:4-1 defines real property subject to taxation in this manner:

"It means all land and improvements thereon and includes personal property affixed to the real property or an appurtenance thereto unless:

"a. The personal property so affixed can be removed or severed without material injury to the personal property itself; or

"b. The personal property so affixed is machinery, apparatus or equipment which is not functionally essential to a structure the personal property is within."

We have informed the Division of Taxation that cogeneration generally fits into both of the above exceptions. In some cases, cogeneration facilities are as mobile as the flat-bed trucks on which they arrive. In others, even larger cogeneration plants are installed with express provision for their later removal, including installation behind doors hinged for easy removal. Finally, of course, they are clearly "machinery, apparatus or equipment" that are located within buildings; they are not identical to the building itself.

The problem for the tax assessor is that as much as 90% of the value of a new structure housing a facility will be the cogeneration equipment. Therefore, the assessor will frequently seek to tax the contents of the building as if it is real property.

Given the economic squeeze already felt by cogenerators that must negotiate with some power-surplus utilities, and in light of difficult air pollution control actions, the last straw for some beleaguered industries could come in the form of an inflated tax assessment.

Perhaps some clarifying legislation will take care of this problem quickly and cleanly, although we realize that was the intent of Chapter 117.

Noneconomic issues: The Master Plan describes a host of noneconomic impediments to cogeneration which can have as much of a deterrent effect on the industry as the more prominent economic problems. These include bargaining inequalities with the utilities and the need for access to the utility transmission and distribution network for wheeling power to other utilities or purchasers. Since these issues are discussed in some depth in the Master Plan — pages 102 through 105 — we will not repeat it here. A copy of the relevant pages will be attached to the written testimony.

In conclusion, cogeneration is here to stay if we make room for it in our regulatory systems. Public utility regulation which assumed that power production is a natural monopoly must, of course, be modified to take into account the resurgence of this old technology. Environmental regulation, which traditionally focused on what is emitted only from the newest stack or the most recent applicant, must be expanded to encompass net consequences of wringing out the last increment of pollution reduction, if to do so will lead to higher overall levels of contamination. And, the tax assessors must recognize that an industry without cogeneration might well be a taxpayer on its way out of his or her community.

In each case, some recognition of the special characteristics of cogeneration is in order if we are to reap the harvest of societal, economic, energy, and environmental benefits which inure to this marvelously efficient technology.

If you have any questions, I will be happy to address them. Again, thank you for this opportunity to testify before the Committee.

ASSEMBLYWOMAN OGDEN: Thank you very much, Commissioner. One of the statements you made-- You said that

the more cogeneration we have, the better air quality we will have. As legislators leave the State House, they pass a district heating cogenerator in Trenton, and many have remarked on that brown plume that keeps coming out of the stack. Obviously that is not, or it certainly does not look to the average person like state of the art. What went wrong there?

ASSISTANT COMMISSIONER BLEKICKI: Well, I have also had a long-abiding concern about that facility, even before the Division of Energy Planning and Conservation came within the Department of Commerce. It certainly does appear to be a major source of pollution for the City of Trenton.

Two things I think we need to review with regard to that facility: First of all, it is a diesel-powered facility, and all of the current applications are turbine gas-powered facilities, which are far cleaner. Therefore, we are strongly in support of the current direction of utilizing turbines that are gas and, in some cases as a backup fuel, oil-powered, because the emissions from those facilities are far, far lower than from a diesel-powered unit.

But, in addition, if you take a netting analysis of that facility, you will see the reduction in pollutants that was the result of the facility, because now the boilers that were in the buildings, or would have been built in the new buildings, are no longer there. We find that, in fact, there is a net reduction, or we believe there is a net reduction.

But, in spite of that, I think the current direction is toward the use of turbine technology, which is far, far cleaner, even as a spot source of pollution, than diesels. We would support the continuation of that trend.

ASSEMBLYWOMAN OGDEN: Would you say that you advocate an overall umbrella effect that would take into account not only what the emissions were, say, from the boiler that the cogenerated unit is displacing, but also dealing with power that we have to import from the Midwest?

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ASSISTANT COMMISSIONER BLEKICKI: Yes, definitely. I think we certainly are the -- if you want to call it beneficiaries -- of the winds coming from the West, and we all recognize the problems with acid rain, which is harmful not only to nature and to the forest, but also to human beings. So, any negatives from that we can use that would reduce the amount of pollution that is coming from the West, as well as from any pollution that we are currently generating-- We think that cogeneration using the traditional controlled technologies is an appropriate technology, and we would certainly support that analysis and approach.

ASSEMBLYWOMAN OGDEN: So, really what you are supporting is taking the issue as a whole, as opposed to just the emissions coming out of a particular stack of the cogenerating unit.

ASSISTANT COMMISSIONER BLEKICKI: Yes. I think that is the sounder way of approaching the problem. However, we recognize that other divisions -- other Departments, for example, the Department of Environmental Protection, may have what they believe to be a different mandate. Even if that is, in fact, the case, we believe there really isn't a major difference in our goals. The utilization of the turbine technology with gas and oil as a backup fuel will result in a lower level of pollution, even within the gates of that industrial facility. Right now, I think there are 11 or 12 applications before the Division of Environmental Quality, and I believe all of them are industrial applications where they would be replacing existing boilers, as well as, of course, reducing the amount of electricity that they have to buy, and therefore reducing the pollution that those power plants would be generating, wherever those power plants may be.

But, just within the gates of those plants, we think there is a net benefit to New Jersey.

ASSEMBLYWOMAN OGDEN: Do you know if any of the applicants for more than 2000 megawatts that have applied will cancel because of the direction that the Department -- DEP -- is going, the state of the art, without some kind of a compromise?

ASSISTANT COMMISSIONER BLEKICKI: I can't say for sure that any of them will cancel, because none of them have said definitely that they will do that. However, we have had expressions of concern that, in fact, it may happen because of this. We know that the costs in installing Selective Catalytic Reduction facilities is quite expensive -- we are talking in the millions of dollars -- and that the operating costs are also very high. In addition, we are concerned that because the technology requires the use of ammonia, that there are other problems which may not have been properly addressed, or at least we are not aware of them having been addressed in their entirety. First of all, you have to ship and store the ammonia out of sight, and second of all, there is a very significant likelihood that, on occasion, there may be an imbalance in the amount of the NO_x versus the ammonia going into the process, and we may have a surplus of ammonia going into the air, which would certainly be harmful to everyone.

Thirdly, we are not sure how the spent catalyst, which mainly is vanadium pentoxide, and is therefore a hazardous material, would be dealt with as far as its disposal. We think that those are issues that have to be addressed yet.

ASSEMBLYWOMAN OGDEN: Just one last question. How does what we are doing in New Jersey compare with other states that are encouraging cogeneration -- I guess California and Texas?

ASSISTANT COMMISSIONER BLEKICKI: Well, I think-- As far as we understand it, there is only one state, and in only one portion of the state -- California -- that is mandating SCR technology. As I understand it, the reason they are mandating

it is because they are a non-attainment area as far as certain pollutants. Therefore, they are mandating a very expensive technology in a limited area of the state.

New Jersey is not in that position, and we believe that with the application of traditional cogeneration technology -- emission control technology, that there will be a significant benefit to the State as far as these pollutants are concerned.

Now, we recognize that by the end of this year, New Jersey, along with 41 other states, may be in a non-attainment status with regard to ozone. We recognize, therefore, that the State -- and that includes not only the Department of Environmental Protection, but also Commerce and every other agency -- should be supportive of any initiatives to bring the State back into attainment. We believe that the requirement to deal with NO_x as a precursor for the production of ozone is only one element -- one very small element -- of a much broader initiative which the State must undertake. We believe that certainly the volatile organics is a much more important source of the generation of ozone, and that if we are to have the desired reduction in pollution in our air, the efforts must be on a much broader base than simply looking at cogeneration as a source of what may be a precursor to the production of ozone.

ASSEMBLYWOMAN OGDEN: Thank you very much, Commissioner.

Next I would like to call on Jorge Berkowitz, Director, Division of Environmental Quality, Department of Environmental Protection.

D R. J O R G E H. B E R K O W I T Z: Madam Chairman, ladies and gentlemen, good morning. My name is Jorge Berkowitz. I am the Director of the Division of Environmental Quality within the New Jersey Department of Environmental Protection. I would like to thank the Committee for allowing me this opportunity to speak about the Division's perspective on cogeneration in New Jersey.

As you are well aware, cogeneration has become an attractive method of energy utilization in this State. Clearly, under the right conditions, cogeneration can result in significant economic and environmental benefits to New Jersey. The Department of Environmental Protection's role is to assure that any new source of air pollution, such as cogeneration facilities, is controlled in a manner that is consistent with Federal and State laws and regulations. To execute this responsibility, the Department requires an Air Pollution Control Permit of all new facilities discharging contaminants to the atmosphere. Within the last year, there has been a proliferation of permit applications for cogeneration facilities, and several more applications are expected in the months ahead.

Since the State Legislature enacted the Air Pollution Control Act in 1954, New Jersey has worked aggressively to reduce air pollution. To our knowledge, this State law was the first of its kind in the nation, and gave a clear indication of the importance which the Legislature placed on clean air. This law has allowed the Department to formulate one of the most highly regarded Air Pollution Control Programs in the nation. A major factor in the effectiveness of this program is that the law allows the Department to mandate permit applicants to use equipment that incorporates advances in the art of air pollution control. This is commonly referred to as the state-of-the-art clause.

Despite the inherent benefits, cogeneration projects cannot, and should not, be exempt from this mandate. Although cogeneration makes more efficient use of input energy than conventional means, the Department is still highly concerned about air emissions from these projects, which can be considerable.

Emissions of nitrogen oxides -- or NO_x , as I will refer to them herein -- are of particular concern. It is

estimated that the total NO_x emissions represented by those cogeneration projects currently either in our permit process, or which we know about, will exceed 12 million pounds per year. This, coupled with the belief that the majority of cogeneration projects will submit permit applications within the year, has prompted the Department to investigate methods of effectively controlling NO_x emissions from these sources now. To this end, the Department is in the final stages of developing a policy, with additional input from the Department of Commerce, for controlling NO_x emissions from gas turbines, the prime form of power selected by the majority of the cogeneration projects, but not the exclusive form.

Nitrogen oxides is a primary air contaminant controlled by the Federal Clean Air Act. The National Ambient Air Quality Standard for NO_x is 100 micrograms per cubic meter based on an annual average. New Jersey is currently meeting this standard. Nitrogen oxides in excess of this standard may have various effects on human health, including irritation of the respiratory tract and enhancement of susceptibility to infections. Perhaps as important as are the health impacts, is that NO_x has a primary role associated with the production of acid rain and as a precursor in the formation of photochemical oxidants by combining with hydrocarbons in the presence of sunlight. As you know, New Jersey is not in compliance with the Clean Air Act's ozone standard, and sanctions loom imminent. And, the very serious problem of acid rain is just beginning to be addressed in New Jersey. NO_x is also a primary contributor to the impairment of visibility. These are three very important air pollution problems. Clearly, we cannot slacken our vigilance in controlling NO_x.

The Department's NO_x proposed control policy was not developed haphazardly. Initially, the Department considered setting a NO_x emission limit that could only be achieved using Selective Catalytic Reduction — or SCR, as I will refer to it

herein. We obtained information from various sources, such as SCR vendors, gas turbine vendors, air pollution control districts in California, as well as a site visit to an operating cogeneration facility with SCR in California. In addition, comments were solicited in January — in this very room, in the middle of a blinding snowstorm— The snowstorm was not in this room, although there was somewhat of a hurricane. Comments were solicited in January from a balanced agenda of cogeneration developers, catalyst manufacturers, gas turbine vendors, and utility representatives in an information workshop on SCR and its impacts on cogeneration. The workshop was sponsored jointly by the Department of Environmental Protection and the Department of Commerce. It was not mandated by any regulation or any law. We did it because we felt we needed to have the facts.

It was through this fact-finding process that the Department became aware of other emerging gas turbine technologies that were also capable of significantly reducing NO_x emissions, without the use of SCR. Hence, a proposed policy was developed which allows for some flexibility in meeting lower NO_x emission levels moving toward an emission limit-based standard. Meetings were held with applicants whose projects would be affected by this policy, in order to solicit their input, and some additional modifications were made as a result of these meetings.

In its current form, the NO_x proposed control policy defines three categories of cogen facilities: The first category is for facilities between one million and 100 million BTUs per hour of heat input to the gas turbines. This is approximately 0.1 to 10 megawatts. Our proposal would require an hourly NO_x emission limit of 0.2 pounds per million BTU when operating on gas, and 0.4 pounds per million BTU when firing oil. These limits correspond to approximately 50 and 100 parts per million of NO_x, respectively. These levels are readily achieved by the use of water or steam injection.

The second category is facilities with heat input rates between 100 million and 250 million BTUs per hour, or approximately 10 to 25 megawatts. Our proposal requires the same emission levels as for the previous category — 0.2 pounds NO_x per million BTUs when using gas, and 0.4 pounds NO_x per million BTUs when using oil. However, on May 1, 1992, we will require these facilities to emit no more than 0.1 pounds per million BTUs when using gas. This limit corresponds to approximately 25 parts per million. The May 1, 1992 compliance date allows for a five-year period for project construction, operation, testing, and demonstration of alternative NO_x control technologies. We have been told that there are gas turbines currently available which can meet these emission limits without the use of SCR.

Further, other NO_x control technologies are beginning to emerge at an ever-quickenning pace. The next two years should see significant breakthroughs in controlling NO_x from stationary sources.

The third category is for facilities which are greater than 250 million BTUs per hour turbine heat input. We provide two options in this category. The first calls for the use of a demonstrated NO_x control technology, such as SCR, with NO_x limits of 0.1 pounds per million BTU for gas, 0.2 pounds per million BTU for voluntary oil use, and 0.4 pounds per million for involuntary oil use, effective immediately.

Let me just quickly define what voluntary and involuntary oil use means. Involuntary oil use is that oil which has to be used because there is a gas shortage. Voluntary oil use is when there is an economic advantage to use oil versus gas, and the Department would allow that.

The NO_x limits on May 1, 1992 will fall from 0.2 to 0.1 pounds per million BTU for voluntary oil use, and from 0.4 to 0.3 pounds per million BTU for involuntary oil use. The applicant will be required to meet these emission limits by 1992.

The Department believes that these NO_x limits are achievable, and that the policy conditions provide applicants a degree of flexibility in choosing NO_x control technologies. In fact, based on meetings with applicants and information on cogeneration projects in-house, and proposed applicants, this policy appears to be acceptable to 19 of the 22 cogeneration applications submitted -- or to be submitted.

Two issues remain to be resolved in finalizing this policy: Netting and grandfathering. Netting would allow sites that experience NO_x emission reductions from cogeneration to exempt their new equipment from state-of-the-art NO_x controls. While on face value this concept sounds reasonable, there are several major perils associated with it. First, it would set a dangerous precedent for circumventing the Department's mandate that all new sources apply state-of-the-art controls, and would put in jeopardy a process that has allowed the Department to make dramatic improvements in air quality over the last decade.

Second, not all cogeneration projects that result in on-site NO_x emission reductions would also result in off-site local air quality improvement. New Jersey presently imports approximately 50% of its energy requirements. Therefore, locating more energy-producing facilities in New Jersey may concomitantly increase total emissions within New Jersey. If you accept phase-out from our western states, fine. If the phase-out does not occur, there may be a net increase. Further, it is not certain that cogeneration projects will displace existing base load power production. Cogeneration may merely delay construction of new central stations within our State.

The concept of grandfathering from state-of-the-art requirements those projects which have reached an advanced stage of development has merit. Many cogen projects were substantially developed before pre-application meetings were even scheduled with the Department. Upon meeting with the

Department, prospective applicants were made aware of potential NO_x control requirements. Much of the commitments and designs regarding turbine selection, control equipment, and the associated funding schemes were well in place prior to even meeting with the Department. This is unfortunate, but it was avoidable. However, in recognition that cogeneration provides substantial benefits to the State, the Department is willing to consider a grandfathering strategy that would minimize impacts on those projects currently in-house for which financial commitments or designs are well-established.

In summary, a NO_x control policy for gas turbines is being developed by the Department which would allow applicants flexibility in meeting emission limits. This policy will strike a favorable balance between environmental benefits and the continued growth of cogeneration in New Jersey, and I think that is important. I think also that you will see that we have moved substantially off the SCR requirement which we perhaps had in January, a considerably more compromised position because we think it is deserved. The policy appears to be implementable and practical and acceptable to the regulated community.

One last thought: I predict there will be a preponderance of testimony today that cites the Department for imposing significant obstacles in the path of cogeneration. However, I ask you to remember that there will be a perspective largely unrepresented here today, and that is the public's. The public cannot be expected to grasp many of the common intricacies involved in these issues. The public's interest, often outmassed by that of the regulated community, must be served by the Department and their elected officials.

Consistently, the public, through their legislators, have said, "We demand aggressive, farsighted environmental control programs." Mediocrity doesn't cut it when it comes to environmental programs in New Jersey, as you know,

Assemblywoman. Recently, our State has been cited for having the second best Air Pollution Control Program in the nation. Our history is replete with pioneering efforts in the field of air pollution control. Pioneering efforts entail, by definition, bold, new approaches, oftentimes without a frame of reference by which to judge, because the other states lag behind. This requires us to employ control strategies which other states have not employed. This causes the regulated community apprehension, and often results in accusations that the Department over-regulates. But, if we are to be true to our public mandate, if we are to continue our preeminent position in air pollution control within this nation, then we will be required to develop innovative, bold control programs.

I predict air pollution issues will once again reemerge as those environmental concerns that most affect the public's well-being. We must proceed with our philosophy and policy that has proven itself to be profoundly effective in improving air quality.

I thank you for providing me this opportunity to comment on this timely issue, and I will answer any questions you may have.

ASSEMBLYWOMAN OGDEN: Thank you very much for being here. If possible, I hope you will be able to stay to, say, one or so. After we hear other people from the private sector who are testifying about problems, I would like to give you a chance to answer some of the issues that have been raised that have not been dealt with before.

Certainly, I think on the part of all of us, and even those who are seeking permits from your Department, there is a commitment to air quality. It is just a question of how we get there, I think, more than the overall goal.

Just a couple of questions that I would like to ask, though, in terms of the-- You said 19 of the 22 applicants will be able to come in under what you are asking. The other three-- What seems to be the problem there?

DR. BERKOWITZ: First of all, I would say that that information was not a commitment -- a formal commitment -- that any of the applicants could meet. It was general information exchanged, and I would presume that you will hear information that will probably refute that today. Nevertheless, there was at least one applicant which I think is important to focus on, who is making the case that it is impossible to employ SCR to this facility, simply because of the design and the arrangement of the facility.

Let me just say this: The state-of-the-art concept, and the state-of-the-art mandate, carries with it the rebuttable presumption clause. If any facility can demonstrate to us that there simply is no way that, for example, SCR can be applied to their facility, and they prove it in a dispassionate, scientific fashion, we would have to accept it. If we didn't accept it, that individual would have the right to an administrative hearing. Then they could have the opportunity to prove their case at that administrative hearing.

So, the state-of-the-art presumption carries with it some heavy baggage, in that it affords the applicant the opportunity to protect his or her position.

ASSEMBLYWOMAN OGDEN: In Commissioner Bleicki's testimony, he referred to the Campbell vs. Sullivan case, and talked about the state of the art, and that while concern for the environment is clearly the prime issue, that on the other hand what is required to reach as little pollution as possible-- You should take into account the costs and the reasonable requirements. Would you basically subscribe to what he said?

DR. BERKOWITZ: We have been operating with the Campbell decision for 15 years -- since the decision. We do factor in cost-effectiveness. It is not the primary nor the sole factor which the Campbell decision causes us to examine. It allows us to factor in the decision-making process with

environment constraints, and environmental goals as well. We know the Campbell decision. We have been working with it for 15 years. We think our position complies with the Campbell decision.

ASSEMBLYWOMAN OGDEN: In connection with the umbrella concept that Commissioner Bleicki supported-- I have the feeling that basically you do not agree with that.

DR. BERKOWITZ: Do you mean the netting concept -- the umbrella concept?

ASSEMBLYWOMAN OGDEN: Yes.

DR. BERKOWITZ: Let me say this about netting: The problem with netting is that there may be disproportionate exposure to various selected publics under the bubble in which the net would apply. If the bubble only applies to the facility itself, that may be one thing. If it applies to a larger area, that means that people within that area may be disproportionately exposed to higher contaminants than previously.

We do feel that on one hand there will certainly be reductions in sulfur oxides and NO_x. On the other hand, we are not so convinced about hydrocarbon emissions. In fact, we think that in certain instances, hydrocarbon emissions may go up. You know hydrocarbons' role in chemical smog.

So, while we do feel that in certain site-specific cases there could be an overall net benefit -- and we are willing to look at that -- on the other hand we think that generically, netting has a lot of liabilities. The point I want to make, though, is that the state-of-the-art concept must be protected. The state-of-the-art concept has allowed us to do very monumental things in this particular State. The state-of-the-art concept was designed to be technology forcing. Our position here, we think, is not technology forcing. So, we feel that to erode the concept of state of the art with netting or bubbles at this point would be inappropriate, but we would look at it.

ASSEMBLYWOMAN OGDEN: In connection with the review period, I know that was a problem that was brought up a year ago. Has this been because you were still working on what your requirements would be, or the emissions control, or is it a problem of lack of staff, or— I am curious about your response.

DR. BERKOWITZ: This is a historical problem. Let me address the generic issue first, and then talk about the specific issue.

The Department has had a backlog of air pollution permits. We have a strategy in hand that hopefully is going to allow-- We have a present backlog of about 1200 permits. The time frame for major permits can be six to nine months; no question about it. We have a strategy whereby we hope the backlog is going to go down to zero. We will be getting around 450 permits per month in to us for review, and hopefully we will be able to turn around 450 permits. But, that is going to take some time.

The issue is specific to cogen. We could have come up with a position a long time ago. It would not have been accepted by the people sitting behind me and, to be perfectly honest with you, it might not have been the right position. We feel that there have been delays. We have been working with our sister agency at Commerce, trying to finalize a position. This process has taken some time. I think we are very close to finalization of the process. The Department of Commerce has sent me a letter, which I have not received yet -- it is probably in my in box -- that finalizes their particular concerns about our position.

One other point, though, which I think you have to realize is, if you want delays, go to regulation. What I heard here this morning already is that we want to go to the public participation process. The Department will be prepared to do that, but know what the pitfalls would be. First of all, if we

went to regulation, those regulations we would look to be retroactive, to regulate the community that occurred prior to those regulations being enacted. That is permissible by law.

Second of all, we might consider a moratorium on anything before we had regulations developed. And, we do not think that would be acceptable to the community -- the regulated communities. That is why the state-of-the-art process exists; that is why it has worked.

ASSEMBLYWOMAN OGDEN: I know that in your testimony you said you are breaking down the applications into three different categories, depending upon the power they are going to generate. Would it speed up the process if you did a similar thing in connection with reviewing the permits?

DR. BERKOWITZ: Yes. We are looking at a permit is not a permit is not a permit concept. We are looking at classes of permits that would allow us to speed up reviews based on potential environmental harm. A very good point, something we are already considering.

ASSEMBLYWOMAN OGDEN: Thank you very much.

DR. BERKOWITZ: Thank you.

ASSEMBLYWOMAN OGDEN: Next, I would like to call on Dennis Baldassari, Vice President, Jersey Central Power and Light Company, because I know he has a time constraint.

D E N N I S B A L D A S S A R I: Good morning, Assemblywoman Ogden. I would preface my comments today by noting that they are directed more toward the second group of issues you referred to today, rather than the first, which has also been the subject of the first two speakers, that being the regulatory economic benefits applications of cogeneration.

As I understood it, today's hearing was to discuss the impediments to the growth of cogeneration here in New Jersey. At least as far as the non-environmental considerations are concerned, it is not clear to me that cogeneration has been impeded in its development here in the State. As an

illustration, I would like to take a few minutes to share with you Jersey Central's experience in this regard.

It has, for some time now, been the corporate philosophy of Jersey Central and its parent company, General Public Utilities Corporation, that the building of major base load generating facilities to meet future system load requirements, is an option of last resort for a number of reasons, not the least of which being the substantial financial risks associated with utility construction. Since we view cogeneration facilities as potentially suitable substitutes for utility-owned generation, Jersey Central began, in the summer of 1985, a major initiative to secure long-term contracts with cogeneration and resource recovery projects. At that time, the Jersey Central had a relatively modest amount of cogeneration which was priced pursuant to a BPU approved tariff. None of that cogeneration was under long-term contract. Our 1985 solicitation sought to have such long-term contracts put into place. Offering pricing terms which included fixed and variable components was included as a basic element of that solicitation. We were willing to front-end load those contracts in the early years -- in other words, pay more than the then current avoided costs -- in order to provide incentives, and to provide financability for those projects. The initial solicitation for 200 megawatts was oversubscribed, and long-term contracts were successfully negotiated.

In 1986, Jersey Central began a collaboration with the BPU staff and the Public Advocate to create a menu of standard offer pricing for cogeneration and resource recovery. By stipulation, prices were pegged to Jersey Central's long-term forecast of energy pricing for the Pennsylvania-New Jersey-Maryland interconnection. Although we did not agree that PJM was the appropriate measure of avoided costs, we did acknowledge that the resulting prices from that effort were reasonable at the time. Once again a solicitation was made,

this time for a block of 600 megawatts of cogenerated power, to be identified as long-term capacity. Any project that met certain minimum requirements could sign a commitment on a first come-first serve basis. As with the 1985 experience, this solicitation was also oversubscribed. The result of the two solicitations is that Jersey Central now has commitments for over 1000 megawatts of cogeneration and resource recovery, all of which -- with a few minor exceptions -- is scheduled for in-service by the year 1990.

What has Jersey Central learned during the last two years? First of all, the offering of long-term pricing with some degree of levelization seems to provide sufficient security to the cogenerator so as to make projects financable. While it does have the desired effect of making project financing possible, it carries risk for the utility customers in the event that the cogenerator fails to perform as expected over the life of the contract. I believe this is one of the risks you referred to in your issues as you started out this morning. As part of our risk assessment, we have become concerned also that of the 1000 megawatts committed to date, over 800 megawatts represent gas-fired projects. The remaining 200 megawatts are resource recovery. Over 50% of the committed megawatts are located in PSE&G territory, and notably there are no significant coal, wood, or other diversified fuels represented in this commitment.

Our selection methodology to date for projects was based primarily on a nondiscriminatory first come-first serve basis. As previously mentioned, this gave no advantage to projects that could be more beneficial to the utility and its customers than less desirable projects. We now believe that the best interests of both our customers and the cogeneration industry in New Jersey would best be served by:

- 1) A more selective acceptance of future qualifying facility contracts designed to better match energy needs and

take advantage of lessons learned as existing commitments are actually developed. This means continuing our practice of periodically establishing procurement blocks, although future blocks need to be smaller and will likely occur less frequently.

2) We need to focus on alternative avoided costs, which suit the characteristics of individual projects and more realistically recognize the costs that are truly avoided by our customers when qualifying facilities are added to the supply mix. One of the obvious characteristics which would impact pricing is the ability to dispatch these cogeneration units in order to more closely meet current system needs.

Also, the addition itself of 1000 megawatts of cogeneration to the Jersey Central system, together, I might add, with about 500 megawatts of cogeneration which has been developed or is under development within the territory of our two sister companies in Pennsylvania, has changed our forecast of avoided costs to the extent that we believe the BPU's 1981 definition, namely $PJM + 10\% + \text{capacity charge}$, is no longer appropriate. That definition, we believe, served the State well in developing initial interests in cogeneration. However, as we move ahead, it will be in the State's best interest to identify a truer measure of avoided cost.

We note that the provisions of the Public Utility Regulatory Policies Act -- better known as PURPA -- are currently under review at the Federal level. We believe that a comprehensive review would also be appropriate in New Jersey. It may be useful to note that neighboring states are reviewing qualifying facilities development and how best to derive customer benefits from such development.

Lastly, let me comment on what has been perceived by some as one of the more significant impediments to cogeneration development. That is the issue of the wheeling of cogenerated power. I would like to be as clear as possible that, if requested, Jersey Central would be willing to wheel cogenerated

power to other utilities. I might also add that we are unaware of any cogeneration project that has failed to develop as a result of any New Jersey utility refusing to wheel power. It is simply an issue which has not as yet — nor do we expect it to in the future — impacted cogeneration.

Based upon our experience, and for the reasons I have just stated, Jersey Central does not believe that there now exists, nor will there exist in the foreseeable future, impediments — again, non-environmental impediments — to the orderly development of cost-effective cogeneration for the purpose of meeting the future power needs of the State of New Jersey.

Again, I would like to thank you for the opportunity to deliver this statement. I would point out that there are other representatives of Jersey Central and of GPU Service Corporation here, if there are any questions from the Committee.

ASSEMBLYWOMAN OGDEN: I have just a couple of questions. When you say that Jersey Central is certainly willing to wheel, I guess the issue that will come up is, what will the price be?

MR. BALDASSARI: Well, the issue of price has been one which has received a substantial amount of publicity, over the last year in particular. There are different methodologies for the purpose of wheeling. I believe some of them have been generally referred to as "postage stamp rates," which basically takes an average cross section of the utility system, and charges each customer for wheeling the same rate. That is a rate which is employed by many utilities. It is one which happened to be employed by Jersey Central where it has wheeled in the past.

However, there are other reasons — good and solid reasons — for adopting a so-called contract path method. I believe the issue of wheeling has two pieces. One is, is there a willingness on the part of utilities to wheel power, and to

my knowledge I don't know of any utility in the State that has refused to wheel cogenerated power to other utilities. The second is the pricing. Up until recently, when there was an attempt to mandate a postage stamp rate on one utility in the State, I don't know that pricing was an issue either in the State. It was perceived to be an issue. It was the subject of some hearings. The result of that forced postage stamp rate was that the price became too high, even higher than the utility was previously charging. As a consequence, I believe there was a compromise which came up with a hybrid postage stamp, which now again brings the price of wheeling to within a reasonable level in the State.

Again, wheeling is an issue which has been addressed on a number of occasions. It has generally been under the jurisdiction of the Federal Energy Regulatory Commission. I continue to believe it has not acted as a prohibition or as a serious impediment to the development of cogeneration.

ASSEMBLYWOMAN OGDEN: You said you didn't think the PJM + 10% + capacity factor was appropriate any more. What are the components of what you are currently offering?

MR. BALDASSARI: Let me take that in two pieces, so there is no misunderstanding. There is no standard offer currently pending for Jersey Central. We have exceeded our expectations for the signing up of cogeneration. Therefore, there is no standard offer currently open. We are continuing to negotiate with several cogenerators for pricing mechanisms which would more closely meet the specifics of their projects.

If we were to go back to establish a new standard offer -- and we have indicated to the staff of the Board of Public Utilities that we are willing to continue those efforts -- we would have to look at alternative supply mixes into the future. We would have to go out 10, 15, 20 years, and see exactly what our supply forecasts would indicate in terms of costs to customers, under various assumptions of additional

cogeneration development, and the lack of that development. The alternative cases would produce for us a pricing level which we could legitimately afford, in order to purchase further cogenerated power. Again, we continue to believe that some levelization is appropriate, in order to make the front-end cost recovery on the part of the cogenerator somewhat more assured, while at the same time we believe that a new vintage of cogeneration will have to carry with it protections against risks that those cogenerators will not be there 5, 10, 15 years down the road, when the economics turn and our customers are actually beginning to save money from that cogeneration development.

So, I think that for the long-term pricing we see looking at true alternative capacity supply plans with and without cogeneration as being the basis for its pricing. Two, we see the need to add some measure of protection to customers if we are going to continue to have a front-end loaded type approach in our contract pricing.

ASSEMBLYWOMAN OGDEN: One last question going back to wheeling. When you said that you are certainly willing to wheel, does that include wheeling to the end users for a transmission fee?

MR. BALDASSARI: At this time, no. The electric utility system, as it has been developed over the last many years, has been developed pretty much as a full service system. It has been developed to supply customers on demand. We do not believe the use of the transmission system, or wheeling from a private individual to an end use customer, is an appropriate use of that system.

I don't know that it is a question that can't be explored further. I think it is a situation, though, where at the moment it would appear that there would be very few to gain, and the chances of the redistribution of costs that would result would actually be not beneficial to the large number of users of our system.

Again, this is something that we look at periodically. To date, we have not determined that it would be appropriate to condone that kind of use of our transmission system.

ASSEMBLYWOMAN OGDEN: Thank you very much.

MR. BALDASSARI: Thank you.

ASSEMBLYWOMAN OGDEN: Next we have a representative from Public Service Electric and Gas, Mr. Arthur Coughlin.

A R T H U R R. C O U G H L I N: Good morning. My name is Arthur R. Coughlin. I am the Manager of Cogeneration for Public Service Electric and Gas Company. On behalf of the Company, I would like to thank you for the opportunity to appear before your Committee.

PSE&G's policy on cogeneration has the following objectives:

- 1) To encourage energy-efficient, economical cogeneration projects in the Company's service territory that are in the best interest of PSE&G's customers;

- 2) To offer to purchase the electrical output of any qualifying cogenerator at a cost that PSE&G would avoid in producing or interchanging an equivalent amount of energy, as established by the New Jersey Board of Public Utilities -- NJBPU; and

- 3) In the event a qualifying cogenerator located in our service territory desires to sell its capacity to another neighboring investor-owned New Jersey electric utility, PSE&G will provide transmission service to effect the transmission and delivery of the electricity to the neighboring electric utility.

While it is difficult to totally foresee the future potential of non-utility generation, PSE&G has recognized the importance and potential of cogeneration, small power production, and resource recovery facilities in our future projections and planning. To date, the Company has contracted

to purchase approximately 100 megawatts of cogeneration and small power production.

Between now and the year 2000 -- 13 short years -- PSE&G is hoping to find some 750 megawatts of generating capacity from cogenerators and small power producers in New Jersey. In addition, we estimate that we will wheel from our system to other utilities in the State another 460 megawatts of non-utility generation. The Company will be providing wheeling service for electricity delivered to JCP&L for cogeneration projects in Bayonne, Kenilworth, Camden, and several others where contract discussions are well along.

A major element of non-utility generation in New Jersey is expected to be provided by resource recovery facilities. If all the combustible garbage produced in New Jersey were burned as fuel to produce electricity, it would provide 4% of the State's electrical needs. At the same time, the problem of refuse disposal would be a long way on the road to being solved.

In line with our ongoing efforts to encourage cost-effective non-utility generation projects, PSE&G offers potential cogenerators "Information Guides" to help them assess whether cogeneration makes sense for their applications. To date, 314 guides have been distributed.

Existing cogenerators will be contacted to obtain information about operating and cost data for their facility. This information will be used to develop case studies for actual installations located in our service territory. The case studies will be distributed to potential cogenerators to promote proven technologies.

We assist potential cogenerators in conducting technical and economic feasibility analyses through an independent consultant, free of charge. Since 1984, 375 customers have been contacted to participate in the program. Eighty-eight analyses were completed, and results returned

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directly to the customers by our consultant. Each participating customer was advised as to the potential for cogeneration, the type of facility that would maximize energy savings, and the expected return on investment.

PSE&G also provides a special Cogeneration Interruptible Gas Rate -- CIG -- to enhance the economics of cogeneration. This rate is currently about 26.4 cents per therm. This is basically the commodity cost of gas, plus a contribution of three cents per therm.

In 1987, the Company has continued to accelerate efforts in the development of non-utility generation by creating the position of Manager - Cogeneration. The purpose of this position is to provide the optimum corporate coordination of all cogeneration activities. The centralized accountability for cogeneration projects will strengthen direct customer contact and provide improved coordination of customer and Company requirements during construction.

In conclusion, PSE&G has an established positive corporate policy toward cogeneration. We have accepted and included these technologies in our capacity planning and load forecasting and encourage cogeneration development by providing information and independent analyses to existing and future customers. PSE&G recognizes the potential of cogeneration to reduce the cost of energy. We are negotiating contracts for power purchase of cogeneration output in good faith and will make every effort to market cogeneration to the fullest extent possible.

ASSEMBLYWOMAN OGDEN: Thank you. I apologize for mispronouncing your name. I had the wrong spelling here.

MR. COUGHLIN: That's okay.

ASSEMBLYWOMAN OGDEN: Do you support the contract path method for wheeling such as Jersey Central subscribes to, as opposed to the postage stamp?

MR. COUGHLIN: Currently, PSE&G has worked out an agreement with the Board of Public Utilities staff for a rate that is distance related. There are three components to that rate: The first is a reservation for capacity for the amount of capacity -- for megawatts that will be generated, or transmitted. Second, there is a loss factor, and third there is a small fee for administrative costs. So, each individual job will be looked at, the capacity that the cogenerator would require, and the distance that power is transmitted.

ASSEMBLYWOMAN OGDEN: And, the other question I asked Jersey Central about wheeling to end users for a transmission fee--

MR. COUGHLIN: Currently, we are against that policy. I can repeat some of their comments. We feel it is not in the best interest of all of our customers. While one particular customer might benefit through lower operating costs, other commercial customers, and certainly residential customers would incur higher costs due to self-wheeling, or wheeling from a private customer to another private customer.

ASSEMBLYWOMAN OGDEN: Assuming the costs are being passed on in the rate base.

MR. COUGHLIN: Yes.

ASSEMBLYWOMAN OGDEN: Thank you very much.

MR. COUGHLIN: Thank you. Copies of my statement are available for anyone else.

ASSEMBLYWOMAN OGDEN: Fine.

MR. COUGHLIN: Thank you.

ASSEMBLYWOMAN OGDEN: Next, I would like to call upon the representative of the New Jersey Pharmaceutical and Food Energy Users Group, Harry Kociencki.

H A R R Y L. K O C I E N C K I: Good morning. I am Harry Kociencki, Chairman of the New Jersey Pharmaceutical and Food Energy Users Group.

Thank you for the opportunity for our group to comment on the impediments to the growth of cogeneration in New Jersey.

Presently, our group is comprised of 11 member companies, representing approximately 75,000 jobs in the State of New Jersey. This group has been formed out of economic necessity to address energy issues and establish positions to present our needs. Most of our member companies have cogeneration plants, are constructing cogeneration plants, or are actively planning cogeneration plants.

New Jersey Energy Master Plan 1985: Most individuals were encouraged when this Plan was issued. It presented a very positive approach to the New Jersey dilemma and offered us hope for the short term and longer future. Cogeneration is one of the keystones of this Plan. Further, the Governor supported cogeneration in his annual address and through conferences and meetings.

There were qualified facility filings for over 2000 megawatts in 1986 for New Jersey cogeneration plants, spurred on by the positive atmosphere adopted to date by the State. Added to this is the fact that 30% or 40% of the electricity used in the State of New Jersey in 1986 was purchased from outside the State. New Jersey's energy costs currently rank 43 out of 48 in America. Since 1979, the State has 964 fewer manufacturing plants than in 1986. Also, 100,000 manufacturing jobs have been lost over the past seven years.

Why would an industry consider cogeneration?

- 1) They are faced with national and international competition.
- 2) Their energy costs are among the highest in the nation.
- 3) Cogeneration efficiencies are typically over 80%, as compared to a utility central power plant efficiency of about 35% -- when it is running.
- 4) Economic survival -- not having to face closing facilities and relocating to more economical, cooperative regions.

What are some of the problems that cogenerators face?

1) Air permitting process: This process can take up to one year. Recently, targets are constantly changing and moving. Some of our questions and/or concerns are:

a) What constitutes "advances in the art" or "state of the art"?

b) Do we just want to be the same or better than California?

c) A "levelized playing field" is desired. How about vehicle emissions, central power plants, conventional boilers, and emissions from other states?

Currently, the New Jersey Department of Environmental Protection is preparing to issue guidelines for emissions from gas turbine-powered cogeneration plants mainly fueled with natural gas. It is our understanding that these guidelines will be administered as rules in currently pending applications and new applications. Nitrogen oxide is the emission singled out with emission limits that are probably not achievable without utilizing processes and equipment which have not been demonstrated successfully in the United States. Imposing this technology could kill many, or most, of the cogeneration plants currently in the planning stage.

I am sure you will hear much more about this subject in today's hearing.

2) Avoided cost buy-back rate for excess electricity: In planning and designing a cogeneration plant, one must address the electrical and thermal requirements of the host facility. In many cases, there is an excess of electricity generated. The current definition of avoided cost is the subject of much controversy across America. The avoided cost used for establishing buy-back rates is totally different than the avoided cost used by a utility in a rate case. A more equitable buy-back rate is necessary.

Also, we are aware that the Board of Public Utilities is currently discussing revision to the cost philosophy for contracting for cogenerated electricity used by Jersey Central Power and Light Company and Atlantic City Electric, without soliciting input via informational meetings or hearings.

3) Wheeling/self-wheeling: The wheeling of cogenerated power from one point to another has been the subject of much controversy. Wheeling can only be done with the agreement of the involved public utilities. We look for this subject to be opened up for further study and investigation.

We also look for the ability of a qualified facility cogeneration plant to wheel excess power to other plants or facilities the cogenerator operates in the State of New Jersey. This subject is covered in a bill currently introduced in the New Jersey Assembly, and we applaud its introduction and farsightedness.

4) Real estate tax issues for a cogeneration plant: The "tank tax" bill requires further clarification, since it is being liberally interpreted by tax assessors in reviewing a cogeneration plant as to what represents real property versus personal property.

In addition, we look for adoption of the bill which we understand is in the Committee that would exempt a qualified facility cogeneration plant from real estate taxes for a period of five years.

5) Natural gas issues fall into several categories:

a) Some gas utilities have, or are considering, special cogeneration incentive gas tariffs. One such utility -- Public Service Electric and Gas Company -- has its CIG tariff, which imposes a heat rate restriction on gas used in a cogeneration plant. As mentioned previously, a plant's thermal, as well as electrical needs, are addressed in designing a cogeneration plant.

In many cases, supplemental firing is required in a waste heat recovery boiler to address the steam needs. This process is more efficient than producing the same amount of steam in a stand-alone boiler. We look for supplementary firing to be recognized and addressed in the tariff, as well as removing the heat rate restriction and substituting language to satisfy the utility company's concern. This has been the subject of meetings and discussion with both Public Service and the New Jersey Board of Public Utilities.

b) Multi-fuel parity pricing of interruptible gas: Currently, a cogenerator who requires additional gas to address supplemental firing needs is faced with a dilemma. The New Jersey Department of Environmental Protection, in its air permitting process, leads you to using the "cleanest fuels." Therefore, most supplemental firing is natural gas backed up by Number 2 fuel oil. When natural gas is interrupted, the cogenerator then activates his backup fuel. Most New Jersey Department of Environmental Protection permits say natural gas must be used, except during periods of utility company interruption. This is totally different than the classical interruptible gas definition, whereby the user is free, because of pricing available at the particular time, to switch from gas to his backup fuel, or vice versa.

We look for this new class of cogeneration backup fuel to be addressed in a new tariff.

c) High pressure gas service: Most gas service to a cogenerator's plant by the public utility is at low pressure. High pressure gas is available; however, the utility claims that since service is already provided, all costs for high pressure service must be borne by the cogenerator, with no recognition in rate structure or reduced costs to cover this situation. This is leading to many cogenerators investigating the potential to by-pass the gas utility and find service by others.

d) Self-help/transport gas: The gas distribution companies in New Jersey have established, with the Board of Public Utilities' approval, very high transport rates for use of their distribution system to obtain this lower priced gas from the wellhead. In all cases, the cost for transport within the system in New Jersey exceeds the cost charged by the interstate pipe lines to bring it from Texas and Louisiana to New Jersey. We look for these rates to be reduced.

We appreciate this opportunity to express our group's views, and look forward to working together with your Committee in resolving these issues. Thank you.

ASSEMBLYWOMAN OGDEN: Thank you very much, Mr. Kociencki. You raised a number of issues here. Can we assume that the order in which they were raised -- starting with the air permitting process and ending up with the self-help transport gas-- Is that the order of priority your group feels these issues are?

MR. KOCIENCKI: I would say, in general, yes.

ASSEMBLYWOMAN OGDEN: I guess one question I had about a bill of mine which was exempting the qualified facility from the real estate taxes for the first five years of its life-- The reason I wasn't able to move that through, together with the other two bills that Senator Dalton and I moved through in both houses, was because of the strong opposition of the municipalities there. I just wonder, in pushing for this, how important you think that is. I mean, is that a make or break issue, or is that just one issue of a number, so that if you put them all together and they were all adverse there could be a no, as opposed to a yes for a go-ahead?

MR. KOCIENCKI: I think it is more the latter. I think it is just that any of these perceived impediments, once they are removed, can do nothing but further benefit the cogenerator's case.

ASSEMBLYWOMAN OGDEN: Thank you very much for being here today. I also think it is appropriate that all of these companies have joined together, and have you as a spokesman for their common concerns. It helps in the presentation for all of them.

MR. KOCIENCKI: Thank you.

ASSEMBLYWOMAN OGDEN: Thank you. Next, I would like to call upon Mr. Bruce Levy of Energy Initiatives, because he also has a time deadline.

BRUCE L. LEVY: One slight correction: The name of the company is Energy Initiatives, Inc. It is one of the most commonly mispronounced, misspelled names we could have chosen.

Energy Initiatives is a subsidiary of Jersey Central Power and Light. I am responsible for cogeneration project development at Energy Initiatives. We were established several years ago to promote the development of cogeneration throughout the State. In that position, we have had to face most of the impediments to successful implementation of these projects.

Our experience spans all sizes of cogeneration, from a small 60 kilowatt system we installed in a senior citizens' apartment building to a 60 megawatt system we are installing in Marcal Paper Mills in Elmwood Park.

I would like to address the single factor that we feel remains the biggest impediment to full-scale acceptance and implementation of cogeneration, and that is the legislated and regulated uncertainty associated with cogeneration. In developing a cogeneration project of any type or size, many things must be considered. These include: fuel supply, electrical interconnection with the utility, permitting on both State and local levels, financing the project, contracting, and, finally, the installation of the project.

There have been various efforts made in New Jersey by legislators, regulators, and other government agencies to help cogeneration project economics, and to simplify the steps

needed to cogenerate. These efforts include: exemption of cogeneration equipment from State sales tax, exemption from natural gas use on gross receipts of franchise tax, issuance of special cogeneration gas tariffs by gas utilities, and the issuance of tariffs by electric utilities defining interconnection requirements, stand-by charges, and pricing for utility purchase of excess power. The proposed issuance by DEP of environmental guidelines for emission limits will also help to simplify the implementation of cogeneration. These efforts have, indeed, helped many small-scale cogeneration projects by defining the environment in which cogeneration must work — the economic and regulatory — and have provided sufficient support for many small-scale installations, as evidenced by the hospitals, nursing homes, YMCAs, and other apartment complexes which are now cogenerating.

Medium and larger scale cogeneration projects generally must be developed and operated in a slightly different environment. They are not as well off in the area's defined environment. The main differences are: These projects, in general, depend on the sale of some of their output to the utility. Also, these projects, due to their larger size, are subject to more intense scrutiny by DEP, and may have to meet more stringent requirements. And, lastly, since these projects usually require new buildings or building extensions, construction of these plants requires approval of local planning boards.

I would like to review the situation which exists, or has existed, on these issues, and why it has tended to impede the growth of cogeneration.

On utility buy-back rates: It has been agreed by utilities -- we heard them say earlier -- my parent company and others alike, and regulators -- that long-term contracts are required to support cogeneration development. Despite this, in the past two years since my company's formation, such contracts

have only been available for about five months -- two months in 1985 and three months in 1986.

In the meantime, potential cogeneration projects wait and project when and at what price future power contracts will be available. These delays have been due both to extended utility and regulator negotiations between purchase offers, and then once a purchase offer has been issued, the quick subscription of these offers, due to lack of controls on these contracts.

One type of control we feel is very important would be some sort of limit on the contract size, so that five or six or seven oversized projects do not close out future offers, as they have in the past. The two or three months the purchase offers have been opened in the past are completely inadequate for reaction response by operating industrial companies which represent the heart of New Jersey industry.

Assume, however, that your company is one of the lucky few who obtain a contract to sell power, as mine was. Of the three or four successful contracts in 1985 Jersey Central offered, all were located in Public Service's territory. As such, wheeling of the power output was required. As many here have discussed earlier, wheeling rates have now been set, after intervention by regulators and other State agencies, and a policy has been put into place only 10 months after the contracts have been signed at Jersey Central. As a matter of fact, some contracts are still in negotiation for people who signed purchase contracts with Jersey Central in November, 1985. While that issued is resolved, it is just an indication of how long it takes to get from Point A to Point B.

The secondary area which larger projects must deal with -- which has been talked a lot about -- is the treatment by DEP for environmental emissions. I am going to limit my remarks on this issue, since much discussion has already taken place, but I think it is important that we have to take our

position. Cogeneration cannot withstand any DEP effort to limit emissions on new sources to make up for what is perceived to be excess emissions from existing sources. Imposition by DEP of excessive emission control requirements can severely cripple the economic health of any cogeneration project. I believe, however, and I was glad to hear Dr. Berkowitz say this morning, that logic may, in fact, prevail in DEP's position, when issued, reflecting a somewhat softening of their earlier positions. If this does occur — and I hope it will — it should be noted that it was only as a result of months of long lobbying and negotiation process which has held up issuance of several air permits by more than a year.

The last area I would like to discuss is that of local town planning boards. These bodies, established to protect the safety and environment of the many towns which make up New Jersey, can often delay, and even kill, a cogeneration project. While some townships are reasonable in their execution of their responsibilities, others can be, and are, uncooperative and anti-industry, trying their best to discourage cogeneration projects of any type. Problem-wise is the fact that most cogeneration installations require some variances from local ordinances, due to building height, block coverage, or, in the worst possible case, allowable use of a zone. Requests for variances are almost viewed as forerunners of certain destruction of the local environment. Despite presentations by applicants of expert witnesses to review technology, safety, and the impact on a town, planning boards almost always decide cases on emotional and political pressures. These issues, I should point out, would only be complicated by any tax exemption, despite how much we would like tax exemption. Taxes are always a major issue in the review of applications.

In many cases, these same emotions govern a town planning meeting where no variances are sought at all.

Cogenerators are given the impression that cogeneration is not wanted in many towns, along with industry that is already there. Most of the experience I refer to is with clean, gas-fired site plan groups. Several efforts by my company to consider coal -- waste coal-fired facilities -- which we heard earlier are desired by utilities, have been given such hostile treatment that site plan approval requests were often withdrawn or never submitted.

As you can see, cogeneration projects, despite their generally accepted economic and environmental benefits, face many challenges with State and local situations the way they are now. Many problems are due to fear and mistrust, mistrust that utilities will pay too much or too little for power, charge too much or too little to wheel power, that cogenerators will pollute too much, and will be an unpleasant neighbor. I believe that many of the laws which exist, both environmental and utility regulation, already safeguard against many of these problems and potential abuses. When it is necessary to deal with conflicting jurisdictions and other conflicts which lead to delay, there is no known environment for cogenerators.

I appreciate the opportunity to present these facts, and I would be glad to answer any questions.

ASSEMBLYWOMAN OGDEN: Thank you, I just have a few. In connection with the reaction you usually find unfavorable by the local planning boards, aren't the facilities, by and large, being added on to an existing plant, or maybe in the case of a hospital, it is something relatively small on the inside?

MR. LEVY: Well, again, there might be two or three classes. I think DEP has broken three classes out -- very small ones -- which very often can be installed inside of an existing building. The same issues do not apply there. Medium and larger cases, where either a building extension or a completely separate building is required-- Some sort of planning board approval is often required in such cases, even for a simple construction permit -- a site plan approval.

ASSEMBLYWOMAN OGDEN: But, the industrial plan is usually there itself, isn't it?

MR. LEVY: Yes, in every case. We have had a couple of installations where we have tried to site small power facilities which eliminate waste fuel, whether it be waste water or waste coal, which do not have an industrial facility. We have generally tried to site these facilities near railroad sidings and, in one particular instance, in an old coal treatment facility that has been shut down for several years. Regardless of that fact, it was viewed by the town as almost an evil proposal.

ASSEMBLYWOMAN OGDEN: Another point you brought up in terms of the contracts-- I believe you said that in 1985 for the long-term contracts, there was only a five-month period and three months in 1986. That seems so short that one wonders how any long-term contracts are negotiated.

MR. LEVY: Well, what you have is a variety of companies -- some industrial companies, some development companies -- that are working, basically, on speculation that there will be a buy-back offer made. There is, at any one time, several hundred, or even 1000 megawatts of cogeneration power under development, and when a utility does issue a standard offer, these developers -- and I am among them -- pounce on the utility and very quickly close out any offer. I would say the only reason it took three months to close out the offer in 1986 was because Jersey Central had a requirement in that offer that a facility must have attained qualifying facility status, and that takes 90 days to get under statutory law. There were a few filings on the QF. The highest level of filings ever in the history of any one state occurred after September 1, the date Jersey Central issued that standard offer. It was closed out before December 31.

ASSEMBLYWOMAN OGDEN: What is happening now in '87?

MR. LEVY: Well, right now, nothing. I have several projects, and I am sure many others do, which are basically waiting for the next standard offer, which I heard today is not going to be forthcoming too soon, and I imagine under completely different formula than has been used in the past.

ASSEMBLYWOMAN OGDEN: Did you say that you have signed contracts without deciding the buy-back rates for more than a 10-month period?

MR. LEVY: No, I believe I was referring to the fact that I had a buy-back contract--

ASSEMBLYWOMAN OGDEN: Oh.

MR. LEVY: --but no wheeling contract.

ASSEMBLYWOMAN OGDEN: I see. Just one last question: In connection with the testimony from Public Service, basically what they seem to be doing is providing informational data to prospective cogenerators. Do you actually provide financing?

MR. LEVY: We, as a company-- We are known as a development company. What we have found is that even with our basic full-time involvement with cogeneration, there are a great many hurdles to pass, and that companies that are in the business of producing paper, for example, don't have the time to be aware of all the intricacies of buy-back rates and contracts. When we provide project development, we provide everything -- all the contracts and the construction management involved in that. We also arrange for financing. We, as a company, do not finance them ourselves.

ASSEMBLYWOMAN OGDEN: Thank you very much.

Next on the list is Nancy Holmes, Cogeneration Partners of America.

NANCY HOLMES: Madam Chair and other members of the Committee: My name is Nancy Holmes. I represent a company called Cogeneration Partners of America. It is a newly formed company in joint ownership between Atlantic Generation, Inc., a wholly owned subsidiary of Atlantic Electric Company, and

On-Site Power Systems, an affiliate of the Morris-Rospond Group. The Morris-Rospond Group has been a leader in the cogeneration field, both inside and outside New Jersey, for a number of years, having installed some of the first cogeneration systems in New Jersey and Ohio.

In a precedent setting case, MRG was successful in having the Pennsylvania PUC require that Pennsylvania electric utilities provide backup service to third party owned cogeneration systems. The case reduced the impact of the Federal Energy Regulatory Commission's ALCON decision, especially since about two-thirds of the states have state utility regulations similar to Pennsylvania's.

We are, therefore, pleased to have the opportunity to address the Committee and provide information on what we see as problem areas and impediments to cogeneration in New Jersey. The problem areas we see involve electric utility unresponsiveness in the areas of stand-by rates, demand clauses, excessive interconnect requirements, and wheeling; unfair gas transmission rates and clauses, plus the availability of gas; and unreasonable environmental regulations.

Those are not necessarily listed in the order by which we stress the importance of them.

By every independent forecast, the potential for cogeneration is substantial in the United States, and particularly in New Jersey with its large industrial base. Cogeneration is an excellent means of keeping New Jersey's industries competitive with their counterparts in other states. It impacts the bottom line. Every decrease in energy costs decreases the cost of a manufactured product or service.

But to facilitate the growth of this fledgling industry, the impediments to its growth must be decreased or removed. The electric utilities in the State must become more responsive to cogeneration, either voluntarily or involuntarily. Stand-by rates, demand clauses, excessive

interconnect requirements, and wheeling charges and requirements are areas that need improvement.

Stand-by rates must fairly reflect the utility's cost of producing and supplying power for a cogeneration facility. Any rates that gouge the cogenerator are counterproductive.

Demand clauses are another impediment to cogeneration. They unfairly reflect the cogenerator's demand for electricity, because of the manner in which they are figured. A more realistic definition on which to base demand charges is needed. For example, an average of the five highest demand peaks in one month would more fairly reflect demand than simply the highest peak.

Electric utilities are requiring excessive interconnection equipment. Obviously, it is in the best interests of both the cogenerator and the utility to have a safe interconnect. However, overkill is unnecessary and an impediment to cogeneration development.

The nation's utility systems are becoming more interconnected and dependent. The market for power is becoming national. Utilities can no longer be narrowly focused on only their service territories, but must look to the entire State's electric grid and outside the State's borders. Utilities need to implement fair and reasonable wheeling charges to help facilitate the flow of electricity.

The Legislature should urge the State's utilities to be reasonable and fair in their dealings with cogenerators. The Legislature should require the BPU to ensure that the utilities are being reasonable in their dealings with cogenerators.

Access to natural gas is limited in New Jersey, especially in the southern part of the State. Transmission rates and contract clauses create problems for cogenerators. The Legislature should encourage new pipe lines for natural gas and help create an environment favorable for this to happen.

Although the Legislature cannot dictate gas transmission rates or contract clauses, it can go on record as supporting reasonable rates and contract clauses and can require the BPU to review and remedy unreasonable charges and contracts.

Environmental regulations: MRG has had the opportunity to work with Environmental Protection Departments in a number of states in New England, the Midwest, and the Mid-Atlantic states, plus New York. Nowhere is the bureaucracy worse than in New Jersey, especially in the Air Bureau.

DEP's Air Bureau has added a whole new dimension to the risk involved in cogeneration projects. The Air Bureau is disorganized; phone calls are often bounced around because no one seems to know who can answer the particular question. I have a very recent example of that. I called down to DEP to obtain a copy of their 1985 Air Quality Report, and it took me three people to get to someone who knew who the right person was, and give me the phone number. It took me two days past that to finally get someone to answer that phone.

The time required to obtain a permit is unreasonable and causes costly delays in projects. It appears that the Department routinely returns applications for information that could be obtained over the phone in order to meet the 90-day limit law. Once applications are deemed complete, 90 days are often exceeded because of DEP's backlog and first come-first served policy. The situation is a serious impediment to cogeneration in New Jersey.

As if the time delays and bureaucratic red tape do not provide enough project risk, the regulations DEP imposes and the methodology used to determine them are at best arbitrary and capricious. A primary example is DEP's recent attempt at NO_x limits for natural gas-fired turbines in cogeneration systems.

It is time to quit playing a semantics game. DEP gets very defensive when you discuss their proposed regulations, and

states that they are not regulations, but guidelines. What is the difference, if, as a cogeneration developer you still must meet the requirements of their guidelines? What is the difference between a workshop and a public hearing, if the information gathered from the workshop is used as though it were information presented at a public hearing?

The situation is absurd. If DEP can circumvent existing laws by calling something a guideline instead of a regulation, then it is the duty of the Legislature to stop the practice and ensure that all State departments follow the correct procedures for enacting new regulations.

In January, the Departments of Environmental Protection and Commerce held a workshop to solicit comments from cogeneration developers on Selective Catalytic Reduction technology. DEP, at that time, felt that SCR represents the best available control technology, while workshop participants, several with actual SCR experience, overwhelmingly felt that the technology is not state of the art, but rather a technology that fits the definition of lowest achievable emission rate technology.

SCR is extremely expensive technology that can literally add millions of dollars in capital costs and thousands of dollars in maintenance costs to the cost of projects. If SCR technology were required for small projects, it would render these projects totally uneconomical.

SCR technology is not reliable in the United States, although it appears that the Japanese have had some success with it. This unreliability adds to the financial risk a potential project financier must examine.

If SCR technology is adopted as state of the art for cogeneration projects in New Jersey, it will kill this fledging industry.

Environmental regulations are a necessary cost of doing business. As long as these regulations are not unfair,

unreasonable, or economically onerous, CPA has no problems with them.

We understand, however, that a recent draft of DEP's new NO_x regulations will have a maximum emission rate based on heat input. It appears doubtful that the higher input cogeneration systems can meet the guidelines without SCR equipment.

EPA's New Source Performance Standard for NO_x is 75 parts per million. Water/steam injection can bring the NO_x emissions from gas-fired turbines down to roughly 40 to 45 parts per million. It is claimed that SCR technology can bring the NO_x level down about 25 parts per million. When EPA states that moving vehicles are the greatest single source of NO_x, it is difficult to believe that requiring SCR technology on any gas-fired turbine will significantly reduce the State's NO_x emissions. It could, however, kill cogeneration in New Jersey.

We urge the Legislature, through this Committee, to draft legislation streamlining the permitting process for cogeneration projects, because the DEP permitting process is the weakest link in cogeneration development in New Jersey. The current situation with its long bureaucratic delays is unreasonable, costly, and untenable.

CPA would certainly welcome the opportunity to work with this Committee to help to facilitate cogeneration development in New Jersey.

Thank you.

ASSEMBLYWOMAN OGDEN: Thank you very much. Do you think that with New Jersey being the most densely populated state in the nation, and with air pollution being a concern of ours and, therefore, DEP being the Department charged with keeping our air as environmentally clean as possible, and working toward even reducing emissions-- Do you think that maybe the best way for industry is for DEP to set standards, as opposed to specific technologies, and allow the industries, at

different levels — for instance, as Dr. Berkowitz pointed out this morning, the three different levels -- and allow the industries themselves to choose what technology they will employ in terms of air emissions?

MS. HOLMES: Well, certainly that would give project developers flexibility, you know, if they knew the standard to which they would have to meet air pollution requirements. Then they, in planning the engineering and all of the things that go into that project, could certainly plan and build in flexibility to meet that. So, from that standpoint, that would certainly be a good step, you know, giving the developer flexibility.

ASSEMBLYWOMAN OGDEN: One last question: In dealing with the Department, is it your feeling that maybe they aren't organized from a public information standpoint, or do you think it is more a question of not having the necessary personnel?

MS. HOLMES: I think it is really, well, maybe a combination, but it is primarily personnel. It appears that they are just swamped and can't deal with 1200 applications, you know, 450 a month, or whatever. The people just simply aren't in place to facilitate getting those applications through.

ASSEMBLYWOMAN OGDEN: Thank you very much. Next, Robert Kostal, from Energy Factors.

R O B E R T J. K O S T A L: Energy Factors welcomes this opportunity to submit testimony to your Committee. We are a developer and owner of cogeneration facilities throughout the United States, and currently have 75 megawatts of capacity on-line and over 450 megawatts under development. In early 1986, we opened our New Jersey office to promote development of projects in the northeastern United States. I am the Business Development Manager for that office.

Two of the facilities under development are in New Jersey with the Schering Corporation as the host company.

These are a 25 megawatt facility in Kenilworth and a seven megawatt facility in Union.

Cogeneration, by simultaneously generating electrical and thermal energy in a single facility, achieves a much higher overall fuel efficiency than separate electrical and thermal energy generations. This efficiency improvement translates into lower energy costs, providing industrial growth and jobs. These benefits are recognized in promotion of cogeneration nationally through the PURPA legislation, and in New Jersey through the Energy Master Plan, support from the Governor's office, and this Committee.

In addition to the economic benefits, the vastly improved fuel efficiency results in lower air emissions than would occur from the displaced boiler and existing utility generating stations.

Nevertheless, in spite of these obvious societal benefits, cogeneration development in New Jersey is facing obstacles that will severely restrict or stop its growth. These obstacles include: 1) Possible new air emission requirements for gas-fired turbine facilities; 2) taxation changes; and 3) insufficient avoided cost rates. I would like to briefly address these issues.

With regard to possible new air emission requirements for gas-fired turbine facilities-- These comments that I will make are being made without the update, if you will, from the sensitive discussions going on between the Department of Commerce and DEP. Jorge Berkowitz gave us a slight insight into that. What I heard this morning was encouraging, and we hope it will keep moving. We sense that that is the way it is moving.

But, prior to December, 1986, DEP had an air emission policy for gas-fired cogeneration units that did three things:

- 1) It established NO_x emission levels that could be met with water or steam injection. These were well-proven and economically viable technologies.

2) It required calculations to determine what additional NO_x reductions could be made by using SCR, an extremely expensive technology. If the cost per pound of additional NO_x removal exceeded certain reasonable guidelines, SCR was not required.

3) It allowed the use of SCR technology in larger facilities to eliminate the lengthy PSD permitting procedure, thus providing earlier completion and revenue flow.

Given these rules, developers planned projects and negotiated the critical contracts with host companies for steam and power sales, with utilities for power sales, and with turnkey contractors for the engineering procurement and construction agreements.

Facilities were designed and preliminary meetings held with NJDEP to ensure correct permit submittals. Air emission permits were submitted, zoning permits obtained, and financing arrangements started.

In late December, we learned that NJDEP was considering a new set of rules requiring SCR on all facilities above 10 megawatts and those requirements would be retroactive to all projects, even those with previously submitted permits.

The Department of Commerce and Economic Development, recognizing the severe impact such a ruling would have on cogeneration development, arranged an informational joint meeting with NJDEP in January, 1987. During that meeting, and at subsequent meetings during the past two months, the following issues were raised, but not resolved:

1) The economics of SCR. For our Kenilworth facility, SCR would add \$1.5 million in initial cost and \$500,000 to \$1 million per year in additional operating and reduced plant reliability costs. Will the previously negotiated contracts support these costs? Are the benefits worth the expenditures?

2) SCR is a new technology with limited performance history.

3) Will SCR work properly in New Jersey, where units must fire both gas and oil due to our interruptable gas supply?

4) The NJDEP concern with NO_x is in its role of a precursor of ozone. This relationship is complex and not universally accepted.

5) Can the requirement for SCR be replaced with a performance standard equivalent to SCR? Under the current market conditions, this results in de facto SCR, since steam and water injection cannot now deliver the lower performance criteria on a guaranteed, dual fuel-fired basis. Without guarantees, the projects are not financable and will not proceed.

I might add, when I talk about financable, I speak about it from a developer's point of view, or seeking outside financing, but it is really no different for an in-house corporation to go to its board of directors. It has to be financable to them, also.

6) For a given facility, can permits be issued at existing performance levels and then lower performance levels be implemented in five years? This idea is deceptively attractive, but it doesn't work. Each system configuration -- water injection, steam injection, or SCR -- requires different design, equipment, and layout. The choice affects original contract negotiations. The project design must be complete and able to meet all current and future permit criteria to obtain financing.

There are three sets of critical contracts in one of these. With the first, if you are dealing with a host company, you have to have an energy services agreement with him, in which you are going to provide certain thermal and possible electrical needs. The second is if you are selling excess power -- contract to sell that power to a utility. The third is your turnkey contractor -- your engineering construct contract. And, a fourth would be a possible wheeling

contract. These are carefully interwoven contracts. They all have to really be in place and structurally sound to take to the financial community. The financial community will look at it and want to make sure that any future permit requirements are in place at the beginning of the project, because, as far as they are concerned, their debt coverage has to be made.

So, we feel that issuing a permit now at one level, and then saying that same facility has to meet some lower level at a future date, really ends up being a non-financable or a de facto SCR project.

7) Should a policy change of this magnitude, complexity, and controversy be resolved in a public hearing format, or as published guidelines or rules? If guidelines, are they flexible and, if so, under what conditions?

I might add here that however that is resolved, we really need open discussion between DEP and the developers. When we submit our calculations, if they are making economic input, we would like to see theirs as to how they do that economic input, and an open sharing, whether that is an open sharing at a public hearing or an open sharing on a per-project basis.

ASSEMBLYWOMAN OGDEN: Are you saying that has not occurred so far?

MR. KOSTAL: Not to the extent we would like to see it.

As I said, these discussions are not resolved, and are continuing among DEP, Commerce, and project developers. We sense that all parties are more aware of each other's needs, and trust that a just and equitable solution will be found. We suggest such a solution could be:

1) All mature -- in other words, developed projects -- be allowed to proceed under the emission guidelines under which they were developed.

2) All prospective projects be permitted to use the best available water or steam injection. Establish goals and

timetables for progressively improved performance standards to create an incentive to equipment suppliers to develop the necessary improvements.

3) Allow cogeneration facilities to claim credits for both displaced thermal energy and displaced utility generation.

Incidentally, California, which is the state that mandates SCR in certain areas, does allow for that type of coverage.

4) All parties agree to revisit the issue in the near future — let's say in 18 months — to measure the progress and, if necessary, reexamine SCR and other developing technologies. In the past month, both Argonne and Sandia Laboratories announced new, non-SCR chemical NO_x reduction processes, with projected significantly lower costs.

5) NJDEP and Commerce conduct a public forum on all sources of ozone and NO_x, and review possible action to reduce those sources. The proposed additional NO_x removal for cogeneration facilities is a very small portion of the total NO_x emissions in New Jersey.

We are submitting copies of our correspondence with DEP regarding this matter, as well as correspondence from organizations of which we are members. This includes the Cogeneration Coalition of America and the National Association of Energy Service Companies to DEP, and the New Jersey Business and Industry Association to the Governor.

The law seems very clear to us, in that the equipment portion of the facility is not real property, but some tax assessors are considering this to be the case, and treating the entire facility as real property is a serious impediment to cogeneration.

With regard to insufficient avoided costs, JCP&L's initial 200 megawatt offering for cogeneration had attractive avoided costs. These rates were sufficient to support the previously discussed SCR equipment on some larger facilities,

particularly when it was combined with faster permitting by elimination of the PSD review.

Subsequent offerings were considerably lower. PSE&G offers only the mandated PJM grid plus 10%. Are the current offerings indicative of the true value of additional energy from cogeneration, or are they artificially low, impeding further cogeneration growth?

We support the Governor's Task Force on Market-Based Pricing of Electricity as a positive step toward the development of proper avoided costs.

Thank you again for this opportunity.

ASSEMBLYWOMAN OGDEN: Thank you. In your testimony, when you talked about SCR adding \$1.5 million in initial costs and somewhere between half a million and a million a year in operating costs, what percentage would that be of the total cogeneration project?

MR. KOSTAL: The total project has an installed value of about \$30 million. So, you know, an additional million and a half to that for the-- That would be another 5% on that, plus the half a million to a million dollars a year operating costs. And, of course, they are kind of bottom line type numbers.

ASSEMBLYWOMAN OGDEN: The half a million to a million is-- That is not involved in the other types of air emissions control?

MR. KOSTAL: No, no. This is just for catalytic replacement and additional downtime for the SCR unit.

ASSEMBLYWOMAN OGDEN: Do you think that your competitive position would be enhanced -- this would be your company as such, not with sharing -- if you were permitted to sell electricity directly to end users?

MR. KOSTAL: Other than from one facility-- Are you speaking, for instance, of a sharing facility to other end users? (no response) I am sure that we-- For instance, our

contracts with the host company offer a discount over their current rate. We have no trouble in offering that discount to take care of all sharing's needs, because that discount we are offering is above the avoided costs. The net cost to them is above the avoided costs to the utilities. So, yes, if we tried to market that to other companies on the same discount rate, I am sure it would be attractive to them.

ASSEMBLYWOMAN OGDEN: Or, if Schering, for instance, could wheel to other plants in the State?

MR. KOSTAL: Yes, if Schering could wheel to other Schering facilities, we would not sell the power to Jersey Central, but would sell it to other Schering facilities.

ASSEMBLYWOMAN OGDEN: I think it was Public Service that testified saying they did not believe that would be in the public interest.

MR. KOSTAL: Well, I heard both of them say that -- both Jersey Central and PSE&G.

ASSEMBLYWOMAN OGDEN: And your reaction to that would be?

MR. KOSTAL: That is an issue, I guess, that is really broader than what we have brought here today. In all of the facilities we have been undertaking throughout the United States, we have not found a position where we could wheel -- self-wheel or wheel to other market facilities. It is an attractive concept to a cogeneration developer. We would like to have it. It is something we suspect would be a long, hard battle, and I guess we see other battles that are more in our forefront -- just getting plants built and operating, in this State and in others.

ASSEMBLYWOMAN OGDEN: Therefore, if it is not available in other states, it is really not a competitive factor?

MR. KOSTAL: That is correct.

ASSEMBLYWOMAN OGDEN: Thank you very much. Stanley Keller, General Electric?

S T A N L E Y C. K E L L E R: Madam Chair, ladies and gentlemen: Thank you for the opportunity to express these comments.

I represent the General Electric Marine and Industrial Engines and Service Division, a supplier of aero derivative industrial gas turbines. GE is dedicated to supplying our customers with gas turbines engineered and manufactured to provide efficient, reliable operation and meet all performance guarantees, while satisfying all required Federal, State, and local environmental regulations.

GE has been a pioneer in developing efficient dry technology combustors to lower NO_x emissions, and has achieved significant further reductions through the use of water or steam injection. These reductions have been achieved with minimal cost and complexity, although such NO_x emission reduction may be accompanied by some increase in carbon monoxide output.

GE recommends that any NO_x emission standards incorporate a heat rate correction factor, so that the allowable emissions are based more on power produced than on fuel consumed. A limit based only on fuel input tends to encourage lower efficiency by allowing such units to generate more NO_x emissions for a given electric power output. This appears to be in conflict with the primary goal of cogeneration of improving power generation efficiency.

It should be noted that the EPA established an emissions formula that contains an adjustment for gas turbines having thermal efficiencies greater than 25%.

Recent reports from Europe indicate that while Germany plans to implement more stringent NO_x limits, it will allow waivers for high efficiency units able to maintain better than a 30% efficiency over all operating modes. GE has not sought such favored treatment for high efficiency units, but we submit that high efficiency should not be penalized.

It is also recommended that temporary higher NO_x limits specified for periods of natural gas interruption be applicable to the use of other alternate fuels, such as LNG, propane, butane, or other fuels suitable for backup usage.

Concerning possible different limits for lower power rating units, we recognize the difficulty in establishing classes that are accorded different limits, and note that such distinctions normally act to drive projects toward the less restricted class. The result could be more smaller projects with generally lower efficiency and somewhat higher emissions.

We wish to thank the Committee for this opportunity to express these comments, and reiterate our offer to work with the New Jersey government agencies in order to provide the maximum economic benefits of cogeneration consistent with the protection of the environment.

ASSEMBLYWOMAN OGDEN: Thank you. I just have one question. When you talk about the possible waivers in Germany for high efficiency units, are you talking about cogeneration units as opposed to traditional boilers, or are you talking about higher efficiency in terms of air emissions? I wasn't sure there.

MR. KELLER: Germany plans to introduce more stringent limits in the future, and for higher generation applications where the units can maintain a high overall efficiency, they plan to allow waivers from the new, more stringent regulations. It is basically to encourage greater efficiency.

ASSEMBLYWOMAN OGDEN: Therefore, cogeneration would be in line for the waivers?

MR. KELLER: Yes.

ASSEMBLYWOMAN OGDEN: Thank you very much. We have seven people left who have signed up to testify, so I think within the next hour or so we will be able to hear everyone, and finish the hearing around one o'clock, or shortly thereafter.

There is a representative from Eagle Point - Cogeneration Partnership. Is it Eldon Heaton?

E L D O N H E A T O N: I will shorten my presentation, because between the efforts of Jorge Berkowitz and Bob Kostal, I think they have covered quite a bit of what we had to say. I will try to summarize.

Basically, in January, when it came to our attention that this was going to be a matter of discussion on SCR in the State of New Jersey, we represented A&R and community energy alternatives as a partnership for the Eagle Point coastal cogeneration project. Our interest in that was that we, as A&R, had been somewhat of a pioneer in SCR usage, and we had some unhappy results with it.

Just to briefly review that representation, it was in the early '80s and we utilized the SCR in a pipe line application for compressors. We attempted to get quotations from the general industry, finding very little response. When we finally did get a response, a 20-month schedule turned out to be, like, 34 months. The final product turned out to have very little availability. We found problems with ammonia control and excess emissions of that into the atmosphere. So, in general, there is a mood, in our company at least, that SCR has not reached its goal yet -- to be state of the art.

The rest of my comments have to do with several points with respect to how the Eagle Point cogeneration project stands, and how we view the air permit situation in New Jersey in general.

First, we would like to reenforce the fact that cogeneration results in inherent energy and environmental advantages. The others who have preceded me have pointed that out in a significant fashion.

Secondly, in the specific case of the Eagle Point cogeneration project, it will result in improved local air quality. The Eagle Point cogeneration project will actually

result in a 12% reduction of NO_x relative to the existing operations at the refinery site. Moreover, through the better stack dispersion characteristics of the new plant, annualized average ground level concentrations of NO_x near the refinery will be drastically reduced by over 80% of the estimated current level.

In addition to the NO_x, even greater reductions will be achieved for SO₂. The reduction of SO₂ amounts to an 87% decrease from current SO₂ discharges. On a ground level concentration basis, the reduction is nearly 98%. With respect to the hydrocarbons issued, there is a very slight difference on the positive side.

The third point is, the Department's proposed performance standards are basically a de facto mandate for SCR. This was written (referring to his statement), obviously, before I heard Jorge testify this morning, and I haven't had time to take a look at what he has told us. On the surface, it would appear that if you are expecting something to happen three years down the line, that is one approach. But, if you are mandating that something happen three years down the line, then you have actually a new source that is three years old. He is trying to set up a guideline for a new source performance, and in three years the plant will no longer be a new source. There is a conceptual problem, in that you wouldn't be able to finance that kind of a project, unless you could show the financial community that you could withstand the financial impact that you could withstand today. So I don't know that it is very helpful.

ASSEMBLYWOMAN OGDEN: You're saying that if it is phased in over a three- or a five-year period, what it really means is that if you go on stream today, you have to have everything in place for what they are going to require three to five years later, because, otherwise, the financial underwriting of it wouldn't be possible.

MR. HEATON: Right. I think it is fine to say that in three years time in the State of New Jersey this will be the rule. That is different from saying that your particular project in three years must suddenly perform differently.

ASSEMBLYWOMAN OGDEN: So, you think it would be fair for a project that started up three years from now, as opposed to one that is starting today, and is being told today that they need to be in compliance with what the regulations are three years hence.

MR. HEATON: Yes, I think that is the good, progressive kind of attitude that needs to be had, to encourage the equipment changes and the kind of technological advances that are necessary. If someone does not pressure for that, it will not happen.

The fourth point is, the current SCR technology is not suitable for certain load following cogeneration plants. Basically, what happens in the technology of plants is, if you can base load them, then the exhaust temperature is maintained within a very narrow band. Basically, under those conditions, the SCR tends to work. But, if it is a very efficient unit, then there are instances where your steam load following to the plant -- to the steam nose-- This causes the plant to need differing amounts of steam, which is usually done by supplemental fire, which changes the temperature in the range where the SCR is. This is why, in some of the more efficient applications of SCR that are not large producers of power, the SCR tends to not be a good application.

So, the blanket requirement for SCR was bothersome to sizing the plants, and the sale of electricity.

The fifth point is, the New Jersey DEP should have considered cost-effectiveness and cogeneration economics when proposing these guidelines. We took a specific look at Eagle Point and the cost of that, and if it would technically work with our particular heat balance, it would be \$20,000 per year

per ton of NO_x. The highest number I have ever seen in any of the states with respect to the abatement of NO_x was \$9000 in the non-attainment area on the southern coast of California.

So, certainly with all of the other factors in favor of the saving of energy and making New Jersey viable from an economic development point of view, cost is a factor, and should be considered. Additionally, the Federal standards by EPA do include that particular aspect.

The sixth point is, NJDEP's proposed guidelines should not overlook other sources of NO_x emissions. It is fairly common knowledge that two-thirds of the NO_x emitted in the State of New Jersey is attributable to automobiles.

Jorge mentioned earlier that there was 12 million pounds per year of NO_x in his permit process. That is 6000 tons. The total NO_x emitted in New Jersey is estimated to be 460,000 tons a year. Out of that, the automobiles are 300,000, and public utility power banks are 40,000. Industrial and commercial furnaces are 100. That is a source which, I submit, would be somewhat reduced by combining the 40,000 and the 100,000 into a single facility. And, then, residential furnaces are 20,000.

The seventh point is, host thermal and utility offsets should be credible. I think that speaks for itself, with the previous numbers I gave you.

The eighth point is, projects in the air quality permit pipe line should be grandfathered. I think, from what I heard this morning, that is a reality now.

The final point is, following the accepted rule-making procedure. For me, it was a little bit confusing as to what the rule-making procedure is, or was, or will be.

I think, over the past two or three months, most of the people in this room would agree that this has been a very successful fact-finding procedure that we have had here. Even though our particular permit has been under consideration for

more than a year now, we do feel it has been valuable with respect to our future business in this State. We hope that in the future when there are changes to be made in the air permit process, that there will be no other fashion that can take place.

Thank you.

ASSEMBLYWOMAN OGDEN: Thank you very much. Is Sue Norris here, from Mobil Oil? (substitute for Ms. Norris comes up from the audience) Possibly if you could sort of summarize this-- In view of the few more people waiting, it would be helpful.

P A U L T A Y L O R: You put a tough one on me there, because I am a pinch-hitter to begin with.

ASSEMBLYWOMAN OGDEN: All right.

MR. TAYLOR: My name is Paul Taylor. I am an environmental engineer at the Paulsboro refinery -- the Mobil Paulsboro Refinery. Boy, this is tough to summarize. Do you mind if I read fast?

ASSEMBLYWOMAN OGDEN: No, that is all right.

MR. TAYLOR: Mobil is considering building a cogeneration plant for its Paulsboro, New Jersey refinery. The envisioned plant would generate up to 170 megawatts of electricity via gas turbines, while cogenerating up to a million pounds per hour of steam to meet the refinery's needs. The new plant would replace an antiquated existing refinery powerhouse which produces steam and electricity. The project would have a positive effect upon the economy of New Jersey.

First, it would have a favorable effect relative to the operation of the refinery with its 1000 quality jobs, which would support thousands of other jobs in the area. Efficient operation of the refinery would also provide the means to remain competitive and continue making multi-million dollar annual tax payments to the State.

In addition, the project will provide many construction jobs during the next few years, as well as permanent jobs to operate and maintain the facility after completion. Also, the additional power generated will provide a reliable resource base to support continued residential growth, as well as growth in the commercial, industrial sectors in New Jersey.

The cost of electricity produced by cogeneration facilities such as ours will be favorable to New Jersey consumers, when compared to other new power capacity construction alternatives, and in comparison to many existing less efficient sources of power.

In terms of environmental impacts, the Paulsboro project, because it will replace an existing facility, will reduce NO_x emissions significantly, using water injection for NO_x control.

Grass-roots projects which do not include a shutdown of existing facilities will increase NO_x emissions, even where they are equipped with SCR. The Paulsboro project environmentally is far superior to any grass-roots project due to its net emission reduction. In addition to NO_x, the Paulsboro project also provides large net reductions in SO₂ and particulate emissions.

Computer air modeling studies have confirmed that ambient air quality around the refinery site, which currently meets all standards, will be improved significantly if this project is constructed. The area is already classified as an attainment area for NO_x, CO, SO₂, and particulates.

The power generated will allow the utility to defer additional power capacity construction further into the future, delaying new plants fueled with oil, coal, or nuclear fuels. In effect, the project reduces emissions now by shutting down an existing plant, and in the future by deferring the need for power plant construction, which has the potential to increase emissions.

Our schedule for this proposed project is very tight. Delays in NJDEP approval of the project, or the economic burden of a requirement to install SCR units for NO_x, could jeopardize the viability of the project and, therefore, negate the environmental and commercial benefits that this project could provide for the people of New Jersey.

The capital investment required for SCR units is extremely high. The estimated SCR cost for the Paulsboro proejct is \$12 million to \$19 million, which may be in excess of 15% of the total project capital cost.

I have some graphs, but I see we do not have a machine to show them on. What the graphs show are the annualized costs per ton on NO_x removed by SCR are substantially higher than the EPA cost-effectiveness guidelines of \$500 to \$1000 per ton of NO_x removed. EPA considered SCR for NO_x control, but rejected it as too costly. The total cost of water injection plus SCR for our project is \$3000 per ton of NO_x removed. The cost of water injection only for the Paulsboro project is about \$1000 per ton of NO_x removed.

Federal new source performance standards limitations on NO_x emissions which can be attained with water injection are specifically determined by weighing the ability of industry to afford emission controls against the environmental benefit derived by the use of the technology.

Some other disadvantages of the SCR process include: significant ammonia emissions and odors, ammonia handling concerns, potential hazardous waste disposal, and less efficient turbine operation, which results in the loss of electrical production.

There has been some research concerning the contribution of NO_x and the formation of ozone. This research indicates that under certain atmospheric conditions and concentrations of NO_x and hydrocarbons, a reduction in NO_x may, in fact, cause an increase in ozone. Due to the complex

chemistry involved, the true contribution of NO_x in the formation of ozone still needs to be fully investigated, and significant NO_x control should not be imposed until the NO_x/ozone relationship is better understood.

The only other state where SCR is required for NO_x control is California, which is in non-attainment for NO_x. Therefore, considering that New Jersey is already in attainment for NO_x, and considering the extremely high cost of SCR, and considering our project's net emission reduction, we feel that SCR NO_x control is an unnecessary and environmentally cost-ineffective control requirement for the Paulsboro cogeneration project, and projects such as this.

We request that cogeneration projects such as ours be permitted to continue without an SCR requirement. A significant amount of money and effort has already been spent on the Paulsboro project assuming that SCR was not needed. We believe that projects should be evaluated on a case-by-case basis, and if the project results in a net reduction of NO_x emissions, that SCR should not be required.

The need for electrical power is real. Projects which meet that need and reduce emissions should be encouraged to be developed so that industry, the consumers, and the environment will all benefit.

Thank you.

ASSEMBLYWOMAN OGDEN: Thank you, Mr. Taylor. From Campbell Soup, John Demaree?

J O H N R. D E M A R E E: My name is John Demaree. I am Manager of Corporate Utilities with the Campbell Soup Company.

I am appreciative of your concern for the problems facing cogeneration in New Jersey, and am pleased to participate in this hearing in the hopes that my contribution, as well as the contributions of others here today, will result in a net positive effect for both cogeneration and the entire State of New Jersey.

In an effort to contain costs at our Camden, New Jersey facility, which employs over 4000 people, Campbell Soup Company has entered into an agreement with the General Electric Company wherein we are working together to install a 50 megawatt gas turbine powered cogeneration system. This system is sized to maximize efficient cogenerated power output, while supplying the plant's entire thermal load. As I am sure you are aware, development of a system of this type and size requires a lengthy and complex effort. At this point, we are in the advanced stage of bringing this project to reality.

Unfortunately, we face a potentially significant impediment in obtaining an air emission construction/operating permit. As we understand them, the proposed regulations governing gas turbine emissions appear to be overly stringent. It appears that the proposed regulations will be at a level achievable only by the use of Selective Catalytic Reduction. By adopting these proposed limits, which are marginally cleaner than those achievable by using current proven technology of steam and water injection, the citizens of New Jersey would not only be exposed to the problem of transporting toxic-spent catalyst from the SCR system, but would be further exposed to the potential transporting and storing of highly toxic liquid ammonia used in the process. In view of the evolving technologies available over the past few years and the ongoing effort in this area now and surely in the future, it seems totally imprudent to arbitrarily select limits only for clean burning natural gas turbine fired cogeneration equipment. It ignores the fact that this equipment may be displacing relatively high polluting fossil fuel fired generating equipment upwind of New Jersey in neighboring states and supplying the plant's thermal needs through a much more efficient process than the two it replaces.

Moreover, the proposed regulations, as we interpret them, do not recognize offset credits for uncontrolled NO_x

emission which gas-fired steam or water injection turbine cogeneration equipment displaces. In addition, other benefits include less VOC from oil combustion and elimination of SO₂ emissions in many instances. We have learned that a recently permitted large gas turbine system in Bayonne, New Jersey will employ the SCR technology. This is the result of the necessity to obtain an air construction/operating permit in a timely manner. I suggest any limits arrived at by DEP which require SCR are mandating a use of toxic substances and do not address other sources contributing to the problem. It should also be pointed out that the State Department of Environmental Protection is under mandate from the Federal EPA to reduce NO_x emissions in New Jersey and has chosen gas turbine cogeneration equipment to bear the brunt of that mandate, rather than approaching the major polluters, such as vehicles and inefficient utility central station conventional boilers. Adopting these limits may make a coal burning system easier to permit and more economically attractive.

Lee Thomas, Administrator of USEPA, in his statement "Final Emissions Trading Policy of 1986," concerning the practicality of internal offsets which the trading policy provides, states: "They confirm the principle that allowing regulated firms to secure equal or better emission reductions at less cost is an important way to get further environmental progress under the Clean Air Act, especially in hard-to-attain areas where most easy targets are already well-controlled." He goes on to say: "It makes an important contribution in terms of needed flexibility, ability to respond to changing circumstances, and stronger incentives for environmental progress."

As a member of the New Jersey Pharmaceutical and Food Energy Users Group, Campbell Soup Company is very concerned about energy costs, as well as the quality of our environment

in New Jersey. We believe that both are achievable through conscientious well-balanced efforts.

Thank you.

ASSEMBLYWOMAN OGDEN: Thank you very much, Mr. Demaree. Next on the list is Mr. Bill Ginn, O'Brian Energy Systems.

B I L L G I N N: Yes, ma'am. I will make my comments very brief. A lot of my colleagues -- colleagues, competitors, what have you -- have made comments here today, and there is no sense going over them.

I would like to bring out one very important point that has been overlooked to date. O'Brian Energy is a developer -- a third-party developer. We currently have three projects -- three contracts -- with Jersey Central Power and Light which have been approved by the Board of Public Utilities. In all three of these contracts, we do face termination dates by the utility. These are termination dates to keep you going to make sure that these things don't fall apart. Mr. Baldassari from Jersey Central indicated that he hopes to have everything on-line by 1990.

At this rate, a lot of the contracts which have been signed -- approved by the Board -- are going to be in jeopardy, without quicker responsive action on the part of several issues. Firstly, DEP, as has been-- You know, everything has been discussed about SCR and what have you.

We are facing a great level of frustration with DEP and the fact that they have been unresponsive to any requests, because of this ongoing debate on sympathy there. However, as an example, we have a Parlin, New Jersey project -- 97 megawatts -- that we have prepared a permit for, and we have been awaiting a decision. We have been awaiting a decision going on four or five months now on this policy.

Further, we had one specific question we requested DEP to answer in the preparation of our permit on February 19. We

have not received an answer yet, even though we were promised 30 days -- a small, but very telling example of what is happening.

As I hear all this testimony today, I am just nervous about the fact that this is going to continue. I would just like to urge -- for myself and for other developers, and also for the benefit of the utilities who we want to honor our contracts with, as well as the ratepayers -- that we need to get on and moving in some direction.

Two other quick issues that have not really been addressed, and I say this from a personal standpoint -- from the standpoint that we at O'Brian have been a little further down on some of these issues -- and they have to do with interconnection. There was a statement, I think by Nancy Holmes, indicating excessive interconnection equipment. We can attest to that. We have one project -- 46 megawatts -- that is in PSE&G jurisdiction and is being wheeled to Jersey Central. We have been at it now for going on six months. The price we were originally given was thrown out at our first meeting, and the cost has now tripled. We still do not have a route. There has not been a route put forth, and we are asking for a timely and a fair type of response to that.

We urge the Committee to consider -- as in other states -- a set policy on interconnection. This goes one step further, because we just got a note, by the way, on our contract in Jersey Central's territory for Parlin, where after interfacing with the utility for over a year and a half-- We got the note, by the way, on April Fool's Day, that, "Yes, O'Brian, you are responsible for the design and construction of the interconnection line, and (indiscernible) right of ways." If that was their policy from the start, fine. But, after several months into the contract, and after a lot of budgeting and financing and things like that, that appears very much to hurt.

We are a national company, and this is the first time this has ever come up. It involves legal questions, as well as procedure. It just appears that it is one of those, "Oh, I forgot to tell you," types of things. "It can't really impede; it can't hurt."

ASSEMBLYWOMAN OGDEN: These are being decided by the utilities themselves, with BPU being involved?

MR. GINN: To this date, ma'am, yes. That letter just came to us about a week ago.

That is really all I have to say.

ASSEMBLYWOMAN OGDEN: Thank you very much. I appreciate your summarizing your thoughts, too. Jorge Berkowitz of DEP has to leave momentarily, but I just thought I would like to give him a few minutes before hearing the remaining two or three more people, to make comments on some of the issues that have been brought up.

DR. BERKOWITZ: Thank you. First of all, I would like to thank the audience for making me a prophet. I predicted that you would hear a lot of testimony pointing out DEP's role in impeding cogen.

I think it is important that you compare the testimony when the record is available. I think what you will hear is that a lot of points that have been raised have already been addressed by my testimony, particularly in reference to the type of technology we are asking for. We are not asking for a particular technology. We are asking for an emission-based technology. As such, I think it is important for you to understand what types of projects are moving through DEP that were approved as recently as last week. These projects are not totally stagnated if a company wants to say, "We accept your guidelines. We can meet those guidelines." That has shown that SCR, in fact-- If SCR is so fatal to cogen projects, I want to know why two of them are moving right now.

I think it is important to realize that the final chapter on what NO_x means to the State of New Jersey, to the citizens, to the air contaminants that we have to deal with, is not being written. I would say that increasingly important is the role of nitrogen oxides in photochemical smogs, particularly in view of what is happening to the upper ozone layer and the relative ease with which photochemical oxidants will be formed.

Secondly, I would also submit we are finding that while hydrocarbons are probably limiting relative to ozone formations, NO_x is assuming a much greater role than previously thought, and that is the subject of a recent report, as recent as two months ago.

I would also submit to you that much of what we have heard today is perhaps not quite factual as we understand it. I have heard that a permit has been in-house for over a year, when, in fact, that permit has been in-house for six months. I have heard for a fact that it was Commerce's idea to have this informational seminar. It was our idea. Commerce facilitated it.

What I am saying to you is-- All I ask is that you compare the record, as I spoke to it. I think you will find that the Department is not applying a kiss of death to cogeneration facilities within the State of New Jersey. Quite the contrary. We recognize they have significant environmental benefits, and we are trying to apply a policy that will allow cogeneration facilities to move forward.

I think it is also important, again, for me to restate what regulations would entail. If people are here looking for regulations, realize that regulations do not allow flexibility. By design, flexibility was incorporated into the state-of-the-art negotiating process. If you are looking for regulations, the Department might feel compelled to put a moratorium on cogeneration facilities, or to apply those

regulations retrospectively. I think you heard that retrospective application of NO_x controls would probably be very difficult.

That is all I have to say at this point.

ASSEMBLYWOMAN OGDEN: I think what people are asking for is what has actually occurred to some extent, which is the public hearing and the input. In other words, while you are not legally required by a guideline to hold a public hearing, and you feel that if you adopt rules and regs that that is a more rigid way of doing it, on the other hand, with so many in this room obviously being critically affected by decisions that DEP makes, they want to be part of the overall decision-making process, realizing that they are not the ultimate decision-makers, but to bring to bear what their experience has been, their knowledge of the mechanics of it, etc.

DR. BERKOWITZ: I think Bruce Levy raised a very good point by saying that one of the things the proposed facilities are going to find is the capriciousness of the local community. I think it is important for the facilities to develop a track record, as many of our resource recovery facilities are beginning to do now, and say, "We have gone the total 10 yards with DEP, to the degree that we know what impacts these facilities are going have on the community."

We have done that with resource recovery facilities. We think that Bruce's perception is right, that the public is scared, for a lot of different reasons -- probably unnecessarily -- related to cogen facilities. We would like to be in a position to be alongside the applicants at the local meetings, saying, "Look, there is nothing to be concerned about. The control technologies that are being applied are not only adequate, but they are the best we have available to us."

ASSEMBLYWOMAN OGDEN: Just one last question. If you are afraid that there will be sanctions from EPA due to ozone violations, and that NO_x causes ozone, but that cogeneration

will reduce the NO_x, why wouldn't you actively promote it as a way of decreasing the NO_x emissions?

DR. BERKOWITZ: First of all, again, we think we would be in a position-- Again, I think we recognized in our statement that there are net environmental gains to be had here. We would be in a position to fall off of a strict definition of the application of state of the art. A strict definition of the application of state of the art might be SCR. We are beyond that at this point, simply because of what has happened in our State already. And, if we did not recognize these environmental benefits, we would not be compromising SCR at this point. We are. We are bending over backwards at this point in time to come up with what we think is a prudent policy relative to NO_x control. We have fallen off of that strict definition of what we think state of the art is to encourage cogen facilities.

ASSEMBLYWOMAN OGDEN: Although, according to the law case cited by Commissioner Blekicki-- He really said that you do have to take this into account -- the total cost. It is a question, you know, of you being on one side in terms of the total cost, and cogeneration companies being on a slightly different side. It sounds to me, from this hearing today, however, that as a result of public discussion, interaction between you and either the companies which want to become involved in cogeneration or the actual companies producing the cogeneration units, that there has been a better understanding of where both sides are coming from.

DR. BERKOWITZ: We agree. We are thankful for the opportunity to have learned. In my opinion, we could have done the non-prudent thing and sat back in Trenton and made the decision, and then let the fur fly. We chose not to do that. I am sensitive to the delays this has caused, and I feel sorry for the project impacts. But I think the short-term inconvenience is going to be worth a long-term investment in a sound policy on NO_x control.

ASSEMBLYWOMAN OGDEN: Just one last question then, Jorge. In talking about the delays, have they been due to your trying to make the decision in terms of what type of air emission strategy you come up with, or is it more a question of your staff being under-funded? I know that with ECRA, for instance, which is the largest program of DEP where the most complaints are received, that, to a great extent, it was a question of not having enough staff.

DR. BERKOWITZ: I would say we do have a problem being able to handle our permits. I think what we are doing now is developing a more streamlined approach, trying to apply better management strategies to the permit backlog. I think there are some legitimate criticisms concerning our Department as to the method in which the permits have been handled. Please be assured that, if we are not totally on top of it, we are making a serious effort to get on top of the permit backlog situation. We have an industrial advisory group -- a task force -- that we are meeting with regularly twice a month, to address strategies which will allow us to break out of the backlog situation.

I think the cogen facilities are, in fact, caught up in a bit of that, but irrespective of the backlog, I think they would have been backlogged anyway because of this issue about NO_x control. For that, I apologize.

ASSEMBLYWOMAN OGDEN: Thank you very much.

DR. BERKOWITZ: Thank you very much.

ASSEMBLYWOMAN OGDEN: We have three more people who wish to testify who have signed up. Claude -- is it Worley?

CLAUDE B. WORLEY, JR.: Yes.

ASSEMBLYWOMAN OGDEN: From Deltak Corporation.

MR. WORLEY: Thank you, Madam Chairman. When you refer to Deltak, I wish to qualify that, in that I do represent this firm, but I am not an employee of Deltak, which is a heat recovery steam generator manufacturer. The comments I will

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present have to do more with addressing the impediments to the growth of cogeneration in New Jersey, as presented in the notice that was sent to me.

Number one, I think this will be a repetition, unfortunately, of some of the comments made earlier, because it seems we stand as a fraternity in the cogeneration field, and we must think alike, I guess.

ASSEMBLYWOMAN OGDEN: Maybe you would like to summarize the points that have been made before and, if there are any new points, particularly highlight those.

MR. WORLEY: Yes, I will try to summarize. We must make a remark about the fact that steam, as obtained from steam turbines, which is the low end of the cycle-- I am addressing the gas turbine situation, by the way, rather than the combined cycle at the other end. Steam that would be obtained from a source of fuel burned at 2500 degrees is really an unreal situation in a gas turbine. The metallurgy of gas turbines would not stand this high temperature. NO_x , for example, has been known to be asymptotically sensitive to temperatures and, therefore, we are much lower by perhaps in excess of 500 degrees below what happens in a fired boiler. In fired boilers, the furnace temperatures are at least 3000 degrees.

The NO_x , therefore, from gas turbine effluence will be much less than replacing fired equipment. I think it is questionable to establish arbitrary standards which have not been emulated by neighboring states -- western Pennsylvania, for example, coming through here, some sections of New York State, and Delaware, even, and the fact that it has been presented before. We have prevailing winds, which add to our situation here.

I am quoting from "Gas Turbine World" issue of November-December, 1986, page 12: "Europe faces stricter de- NO_x rules by 1990 for CHP plants." This reduction, by the

way, based on a reduction perhaps from 75 ppm corrected to 15% excess air, is only at 50 ppm, a level which we are now achieving with standard procedures of water and steam injection. Nevertheless, as a resident, I am very sensitive to the pollution sources in our State, but as well, the present order of magnitude. Certainly, motor vehicles are by far the greatest pollutants, yet we seem to put undue perhaps emphasis on the cogenerators — a relatively new industry in the State. Utility plants are next, again as we stated.

I do favor the envelope system mentioned by some of the petroleum-related people coming before my case. The envelope seems to make a lot of sense, because they can apply the particular present-day technology to reduce and do things according to their own needs.

No one seems to have addressed the subject of NO_x emissions with respect to the height of discharge. For example, as mentioned, cars and trucks emit NO_x at a very low level. NO_x is much heavier than standard air. Therefore, we will breathe this to a greater extent. Cogenerators will have stacks of 75 feet, possibly 100 feet, depending on local ordinances, and we, as citizens, or the animals in New Jersey, will not be affected by this as much as we would be by the lower level heights of car emissions.

Another aspect not discussed it seems, is the fact that a gas turbine can be operated in different modes. Well, I did mention that. Thinking that no one would refer to it, I included this in my written statement, but it has been referred to.

Straight exhaust, that is, unfired exhaust, is usually at a level of 800 to 1050 degrees F. As stated earlier, the level of NO_x is not as severe when a unit is designed for straight exhaust. You can be much more efficient, it was presented by earlier people, with an exhaust that will be raised to possibly 1100 to 1700. Present technology with

burners that are so-called duct-fired burners permit this. This renders the overall efficiency of the plant many percentage points higher than the straight exhaust gas turbine. This is accomplished with-- The additional supplementary firing is accomplished with natural gas as a clean fuel, and Number 2 fuel oil as a stand-by fuel in case of interruptible gas supply contracts.

It would, therefore, seem appropriate to review the different modes and operations on an individual case. Few situations tend to be exactly alike. As has been described, gas turbines are very site-oriented machines -- and they truly are.

I would urge that the economic side of the decision by the State be kept in perspective. We cannot be an island unto ourselves. We must act in concert with other neighboring states, and possibly provinces, including Canada, to establish such standards, which do make sense on an economic basis.

There is a third mode of operating heat recovery blowers not discussed here currently. We are talking about the fresh air firing method. I assume that some of you are familiar with it. This consists of being able to generate steam when a gas turbine is inoperative. To achieve this, the manufacturer must provide large I.D. fans, which simulate turbine exhaust flows, so that the heat transfer surfaces will sense the same mass flow velocities and resulting pressure drops as when the turbine is on stream. For this, the burners which are used are redesigned from a straight duct type burner, and there is some duct work associated with it. This is an additional expense for the plant operation but, on the other hand, it permits an operator who does not want to lose his steam capability -- capacity -- to operate with one single type of unit, and not have to go to a stand-by blower, which may take as much, or perhaps more, than one hour to be put on-line. Firing temperatures for such fresh air fired burners

can range in temperatures from 1200 to 1300 degrees; again, a level which is not of real concern for NO_x.

Thank you very much.

ASSEMBLYWOMAN OGDEN: Thank you. Mr. Scott Turner, Independent Energy Association of New Jersey?

SCOTT M. TURNER: Thank you, Madam Chair. My name is Scott Turner. I am a partner with the law firm of Nixon, Hargrave, Devans & Doyle, based in Washington, D.C., New York City, and Rochester, New York. I am appearing here this morning -- this afternoon now -- on behalf of the Independent Energy Association of New Jersey. This Association was formed earlier this year as a New Jersey not-for-profit corporation, and was organized to, among other things, provide for a forum for the exchange of technological ideas, concepts, and economic analysis to benefit all users and potential users of independent energy.

I do not have a copy of my prepared remarks available at this point, but I will get them to you within the next couple of days. I was asked by the Independent Energy Association of New Jersey to appear here today because I have been actively involved in the determination in the South Coast Air Quality Management District in California, which led to the selection of the Selective Catalytic Reduction as the lowest achievable emission rate for two gas turbine applications in 1984. Because of that, the Association asked me to share my perceptions on that process and its outcome with this Committee.

I will not dwell on the particulars of that particular process and outcome. I will certainly go through those in some detail in my written submission to you. Let me just leave you with a couple of observations from that process, and then conclude by commenting on a couple of assertions or observations I have based on what I heard today, principally from Dr. Berkowitz.

Because the SCR phenomenon was, indeed, spawned for the first time in the South Coast Air Quality Management District, it is important to understand both the political and the technical imperatives that led to the particular outcome in those two permit application proceedings in 1984. My conclusion, having gone through that process, and being eminently involved with it, is that the political and technical imperatives that were evident in that part of California in 1984, are not evident here in New Jersey in 1987. I will detail the bases for my conclusion in my remarks.

I would note here, somewhat parenthetically, that in California, like apparently here, cogeneration is being looked to as the industry on which NO_x controls should be imposed as a means of controlling an ozone problem or, in the case of California, a NO_x problem, when, indeed, that industry itself is a small contributor to what is otherwise a large problem. Could it be, I would ask somewhat rhetorically, that the cogeneration industry is perceived here as it was in California in 1984, as somewhat a new industry, as somewhat weak and disorganized, and as a vulnerable industry to these kinds of controls?

It is important to recognize that notwithstanding what has transpired in California since 1984, to date, SCR has not been incorporated, by rule-making, into the South Coast Air Quality Management District Air Pollution Control regulations, which are applicable to either new or existing gas turbines. Yes, the South Coast staff is presently considering making a proposal to its District Board in that regard, but that staff proposal has to undergo formal rule-making. Right now, it is undergoing an environmental impact statement review at the staff level. That environmental impact statement, obviously, will be subjected to public scrutiny before it is put into final form.

Much of the testimony that was presented at the January 22 workshop — or hearing, if you will — here in this very room, demonstrated, at least in my view, and I am sure in the view of others, that the questions which were raised in the South Coast Air Quality Management District back in 1984, continue to persist. Limited SCR data continues to be a problem. Experience with SCR applications in the United States has not increased significantly since 1984, and what little experience there has been has produced mixed results. Catalyst performance, especially on oil, and ammonia storage and slip concerns— Catalyst disposal concerns continue to be large issues.

Finally, as we have heard today, financability and cost-effectiveness issues continue to suggest that most, if not all, projects cannot survive the costs and risks imposed by a SCR requirement.

So, the political and the technical imperitives at work in Southern California in 1984 just don't seem to be evident here in New Jersey in '87. New Jersey attained the NO₂ standard. Ozone, while it continues to be troublesome in New Jersey -- troublesome is perhaps too mild a word for it-- The role of NO_x in ozone formation is not well enough defined to serve as a basis for imposing SCR requirement on cogeneration sources in New Jersey.

Now the proposed approach that Dr. Berkowitz outlined today is certainly better than some immediately effective across-the-board SCR requirement, which apparently was where DEP was headed prior to at least the informal workshop -- hearing, what have you — on January 22. Headway is being made. I think it is an important recognition on DEP's part that there is a need for three distinct source categories, and we certainly applaud their decision in that direction. But, SCR does, in fact, remain part of DEP's approach, whether today or in 1992. The way the rule is presently proposed, it would, in fact, be de facto in position of SCR.

The premises on which DEP has apparently based its decision to mandate SCR by 1992 on the mid-size and larger cogeneration sources must be placed on the table for all to examine. We heard from Dr. Berkowitz today the implication that the cogeneration sources that have been applied for to date would emit major NO_x emissions. The implication was that those would be major emissions relative to other NO_x sources in the State, and yet just a few moments ago, we heard that in reality that would probably be some 6000 tons out of total NO_x emissions of well over 400,000 tons.

We also need to examine in a public forum the apparent conclusion of DEP that NO_x is a primary cause of New Jersey's ozone non-attainment problem. But we need to know more about DEP's position on how NO_x's role compares to that of hydrocarbons. I guess I would ask this Committee, and I would certainly ask DEP, why other urbanized states which also have ozone non-attainment problems -- like New York, like Illinois, like Florida-- Why are they not embracing Selective Catalytic Reduction? Instead, they adhere to the Federal New Source Performance Standards as best available control technology.

Finally, I think we need to examine DEP's apparent conclusion that 25 parts per million apparently achievable by SCR-- Why is that achievable by 1992 on mid-range gas turbines? This de facto imposition of SCR, if it will work then, is apparently not acceptable now as DEP has concluded. We need to know more about why DEP thinks it will be acceptable in 1992.

There was the assumption on Dr. Berkowitz's part that other technologies will be available in 1992. Well, will they, in fact? We need to know what DEP is thinking in that regard.

So, obviously, more public examination of DEP's key assumptions is needed. Need that be a formal rule-making? Well, perhaps not, as is shown by DEP's apparent willingness to consider what I heard at the January workshop -- apparently

softening its earlier proposed approach. But, public input and examination continues to be critical. Dr. Berkowitz's suggestion that if DEP had to embody the emission limits in regulations it would make them retroactive on pending permit applications is, to me, a surprising sentiment. It is certainly not required that he make them retroactive, and it is certainly inconsistent with what we heard him say earlier about his belief that grandfathering, under his proposed scenario, is appropriate for equitable reasons. If it is appropriate there, why not appropriate if the SCR -- if the emission limits are contained in a formal rule?

As to his point that regulations are inflexible, and DEP has more ability to deal with applicants on a case-by-case basis under these informal guidelines, well, that may or may not be true. Certainly, regulations can be written with variance mechanisms built into them, and I am sure there are a number in New Jersey that have been.

So, to sum up, we have made progress, I think. DEP has made progress, but this latest iteration of DEP's thinking needs to be examined more carefully than I think most here today have had a chance to do. With that examination needs to come some more thinking about the grandfathering issue. I think DEP is headed in the right direction there, but that needs to be resolved in final form, and more thinking, I think, needs to be done about utility displacement credits.

So, DEP does need to continue to publicly seek input and review, but, at the same time, I think we heard today that there is a need to continue to process permits in the pipe line in both an equitable and an expeditious manner.

I will have my comments to you by the end of the week, I suspect.

ASSEMBLYWOMAN OGDEN: Thank you. Would you also please send a copy to Jorge Berkowitz?

MR. TURNER: I would be happy to do so.

ASSEMBLYWOMAN OGDEN: I am sorry he had to leave just before you testified.

MR. TURNER: Jorge has heard some of this before. Thank you very much.

ASSEMBLYWOMAN OGDEN: Okay. One other question: Would you favor a policy under which the emissions were a factor in the overall selling price of a cogenerator's output? In other words, if they were required to spend more than they anticipated for emissions control, should that be taken into account in the total price?

MR. TURNER: If there were a mechanism to do that, Madam Chair, I suspect that would be a way to certainly ease the financing problem. How easy and how quickly such a program could be implemented really depends on the Legislature and the Board of Public Utilities, as to whether they would be prepared to implement that kind of a proposal. Certainly, it would ease that particular concern.

Now, the concern it would not deal with is the technical risk inherent with some of these new technologies.

ASSEMBLYWOMAN OGDEN: I understand that. Thank you.

We just have one more person, Stephen Eber, from Ebasco, although I understand that Barbara Curran, President of the Board of Public Utilities, also wishes to speak.

S T E P H E N E B E R: I am going to be extremely brief.

ASSEMBLYWOMAN OGDEN: As soon as you are finished, Barbara Curran will come in.

MR. EBER: Thank you very much. I will be very brief. I represent Ebasco, and our sister company, Envirosphere.

The purpose of my speech is simply to reaffirm what we stated on January 22, 1987. I want to put the same material in your hands that we put in the hands of the Department of Commerce and the Department of Environmental Protection. We presented technical data which concerns the costs and

environmental impact and engineering information regarding SCR as a NO_x emission control technology.

I want to reaffirm the fact that SCR, on the basis of our study, is currently not state of the art, but it does deserve further research.

I want to make one comment regarding the fact that other alternates were made available. I have to point out that dual fuel units currently studied -- GE's unit, for example -- do not get down to 25 parts per million on steam or water injection. A gas only nozzle will do this. If I am wrong, please correct me, but there is no alternate technology on most-- There is no alternate technology, as Dr. Berkowitz indicated. By default, they are asking for SCR, under current known technologies, if dual fuel is to be employed, which it has to be.

I compliment the fact that there may be grandfathering. If that occurs tomorrow, I will be a very happy person.

Other suggestions I would make before I wrap up are: Consideration should be given to pounds of NO_x emission per BTU of output of a plant. I don't want them to spend months debating this. This is something for the future, but cogen units get so much more efficiency than standard units, even standard combined cycle units, which do not make process heat. But, you are getting double your money. It's like a car that gets 50 miles to the gallon and a car that gets 20 miles to the gallon. If they both emit the same pollutants, well, you are getting much more mileage out of a cogen plant.

The other suggestion is that perhaps New Jersey should build a cogeneration plant for research purposes, so they could really take a look at all these factors we are talking about -- a small prototype unit -- that can serve way down the line as a model for the future.

Those are all my comments. Thank you.

ASSEMBLYWOMAN OGDEN: Thank you very much. While we are waiting for Barbara Curran, I would just like to thank everyone for coming today, and say that I hope you feel this has been helpful, to a certain extent, in trying to bring these issues home to DEP. I know they are not hearing any of this for the first time, but maybe out of all this, if we still do not resolve these problems, will come legislation to help to deal with them.

President Curran, we thank you for coming to be our final speaker today at this hearing. We also thank you for the use of your hearing room.

B A R B A R A A. C U R R A N: Well, I apologize, I certainly didn't have a long way to come. I apologize for my delay, part of the reason for which is that when we made the commitment to have your hearing here today, we did not foresee the garbage crisis that would arrive. So, we have spent much of our day having hearings in other parts of this building on solid waste problems, so that we would not disrupt your hearing. Perhaps the best thing I could offer would be not to give you a resume of what is happening with the solid waste crisis in the rest of the State.

The comments I would like to make today are really very general in nature. They would begin by first of all reiterating the Board's very firm commitment to cogeneration -- the development and expansion of cogeneration. I say that at some risk with my back toward some representatives of utility companies, but the Board has long felt -- and I personally feel -- that this State, having as much as it does by way of benefits, but lacking as much as it does in natural resources that could be used primarily for energy-- New Jersey cannot afford to waste, in any way, the potential resources it has, and certainly we feel that cogeneration is very strong. We do not, in any way, lessen our commitment to conservation and, frankly, have applauded the efforts of Assemblywoman Ogden and other members of the Legislature in that regard.

We are especially glad to hear of your interest in regard to the proposals you have been hearing commented on today, because we feel that if we have a Legislature that looks forward to what can serve the public best -- all segments of the public -- that, in fact, all of the residents of New Jersey will benefit.

The Board is committed to working out as practicably as possible the best possible rules with regard to cogeneration, as we have indicated at other meetings. In a recent cogeneration seminar, then Energy Commissioner, Leonard Coleman, introduced me as the most unreasonable member of the Governor's Cabinet. That may be true, but on the basis that all I had to do was figure out a way to set cogeneration rates at the highest possible level to placate the potential cogenerators, and at the lowest possible level to placate the utility companies-- Beyond that, there really was no problem. (laughter) That is a fair analysis of the job I have.

We feel strongly that what we have set as Board rules and policy in cogeneration has been necessary and helpful. It is by no means chiseled in granite. We are looking to review the question of cogeneration ourselves. We look to the Legislature to provide what assistance and recommendations they would have. I would be unfair if I did not indicate that the strongest concern we have, having approved in the State to date approximately 610 megawatts of cogeneration and small power production capacity-- The strongest concern we have right now is in regard to the question of wheeling. The wheeling rates we have put into effect have gone through a metamorphosis on their own. First we looked at the postage stamp rate as being the most practical. We did that because we felt that the best interests of cogeneration would be served by avoiding the protracted negotiations that often ensue in contracting with utility companies, especially in regard to wheeling.

Frankly, when we had that policy in effect — brief as it was — we talked to a number of cogenerators who just plain said they could not see why a postage stamp rate made sense. They simply looked at the distance and said, "There has to be an economic impact to that distance," and certainly there is. Therefore, a distance-based rate would be more practical and more understandable and more encouraging to them. Frankly, the Board looked carefully at that; talked with the utility companies and with our own staff, and developed a rate that we felt was helpful to cogeneration. It also is by no means the only way that a wheeling rate could be set.

Our concerns now go to concerns that I believe you, Assemblywoman Ogden, also have; that is, to look at the questions of wheeling as they will be really handled in the State in the future. By that I think the most significant concern we have is the question of wheeling from one facility to another, both facilities, the assumption would be, being owned by one entity, obviously, for instance, large manufacturing companies. We are looking at that question. We applaud the Legislature for looking at it and, frankly, would await the kinds of information that you would be able to derive for us. We feel strongly that that is the next area that the Board has to consider in a timely fashion.

I would also say here that for the most part, as much as there may be individual problems, we really believe strongly that the New Jersey utilities are also committed. I am sure they have spoken on their own behalf, so I won't attempt to do that. But we feel that for the most part they are committed to realistic cogeneration. There is no possibility that the Board could legitimately — under the present rules — could legitimately say that we will force, if you will, utilities to accept any cogeneration that is offered to them. We feel strongly that there must be some standards. There certainly must be safety standards and technological standards that are

adhered to. I think honestly those problems are more easily resolved than questions of capacity standards.

It would be foolish for us to say that the present rates and the present procedures must stay in line in regard to requiring all utilities to take any amount of cogeneration that is offered to them. Therefore, I think a logical extension of our policy, which would have to be developed, would be the question of sales to non-utilities, be they sales and/or wheeling within one company, or sales outside of utilities. We, of course, would always have the question at the Board -- which could be considered by-pass, if you will -- if this would be permitted, what the effect of that would be on the overall ratepayer. The Board must be cognizant under the law, and I think under practicality, of the effect of this by-pass, if down the line this is a significant question -- the effect of that by-pass on the remaining customers of the utility company.

We have very expensive, very highly developed technological facilities in this State that are, I think for virtually all parts, serving the customers well. As much as we want to move to a more efficient manner of making sure that we can perhaps avoid, for the short term, and maybe even into the long term, any additional expensive building on behalf of the utilities, we must also be reasonable and, therefore, cannot say carte blanche that we would require the utilities to purchase any and all cogeneration offered to them, nor can we say that we would not take a very careful look at sales to non-utilities, because we feel it is in the best interest of the ratepayers who are served by the present companies to take that look.

I think the key word that the Board wanted me to express today -- and I do appear not only on my behalf, but on behalf of Commissioner George Barbour and Commissioner Bob Guido -- is to indicate that we have a flexible attitude. We feel cogeneration is essential. We are looking at the wheeling

questions, and would certainly be appreciative of your concerns and advice and recommendations in that matter. We will try to be realistic in developing a policy that is helpful to all of the ratepayers of each of our utilities, and invariably then to all of the taxpayers and voters of the State.

ASSEMBLYWOMAN OGDEN: Thank you. We did hear, on the subject of the direct marketing of cogeneration electricity by the utilities, that they do not believe this is in the public interest. Is this an issue that the BPU is going to be dealing with?

MS. CURRAN: It is. I can't say it is an issue we have a planned docket on. Frankly, those questions usually come to the Board two ways. We look at them theoretically, which is exactly the process that is going on now, but certainly not in any great depth. Hearings like this and bills like yours would generate that kind of thought on our behalf. The other way those questions move to the Board would be as a specific application, a letter, a motion, or something of that nature, usually by what is perceived to be an aggrieved party. Then we would have to handle the case specifically.

ASSEMBLYWOMAN OGDEN: One other issue that came up was that of the interconnections. It was stated that they were excessively costly and the procedure was really a cumbersome one. According to the person who testified, this was done entirely between the utilities and the cogenerating facility, as opposed to the BPU being involved. Do you anticipate that the BPU will become involved in this in the future, in terms of setting standards?

MS. CURRAN: That's a good question. Honestly, whoever testified is right. That is the way the procedure works now. Therefore, and also through my own lack of not being an engineer, I probably would not have even glanced easily at material that did come to my attention. That is certainly something that we can take a look at.

Is Mr. Gable here? (speaking to someone in the audience)

UNIDENTIFIED SPEAKER FROM AUDIENCE: He is out of the room right now.

MS. CURRAN: He is not in the room? I honestly don't know if he-- Do you know, to the best of your knowledge, if he has gotten requests of that nature, or--

UNIDENTIFIED SPEAKER FROM AUDIENCE: Not that I am aware of.

MS. CURRAN: Not that I am aware of either, but certainly we will take a look at that, and work with our electric staff on those questions. I honestly don't have any further information on it, because -- to the best of my knowledge -- it has not been raised to that level of having a motion, a letter, an application of concern expressed to the Board.

ASSEMBLYWOMAN OGDEN: Certainly what we can do when we receive the transcript of this hearing is to share it with your office, so that some of these issues can also be studied by the BPU.

MS. CURRAN: Thank you. I believe some of our staff members were also auditing this meeting today, and we will ask them to proceed even on the information they have gotten just through sitting in.

ASSEMBLYWOMAN OGDEN: Thank you very much for taking a brief respite from the garbage crisis.

MS. CURRAN: Thank you for the respite. Thank you very much.

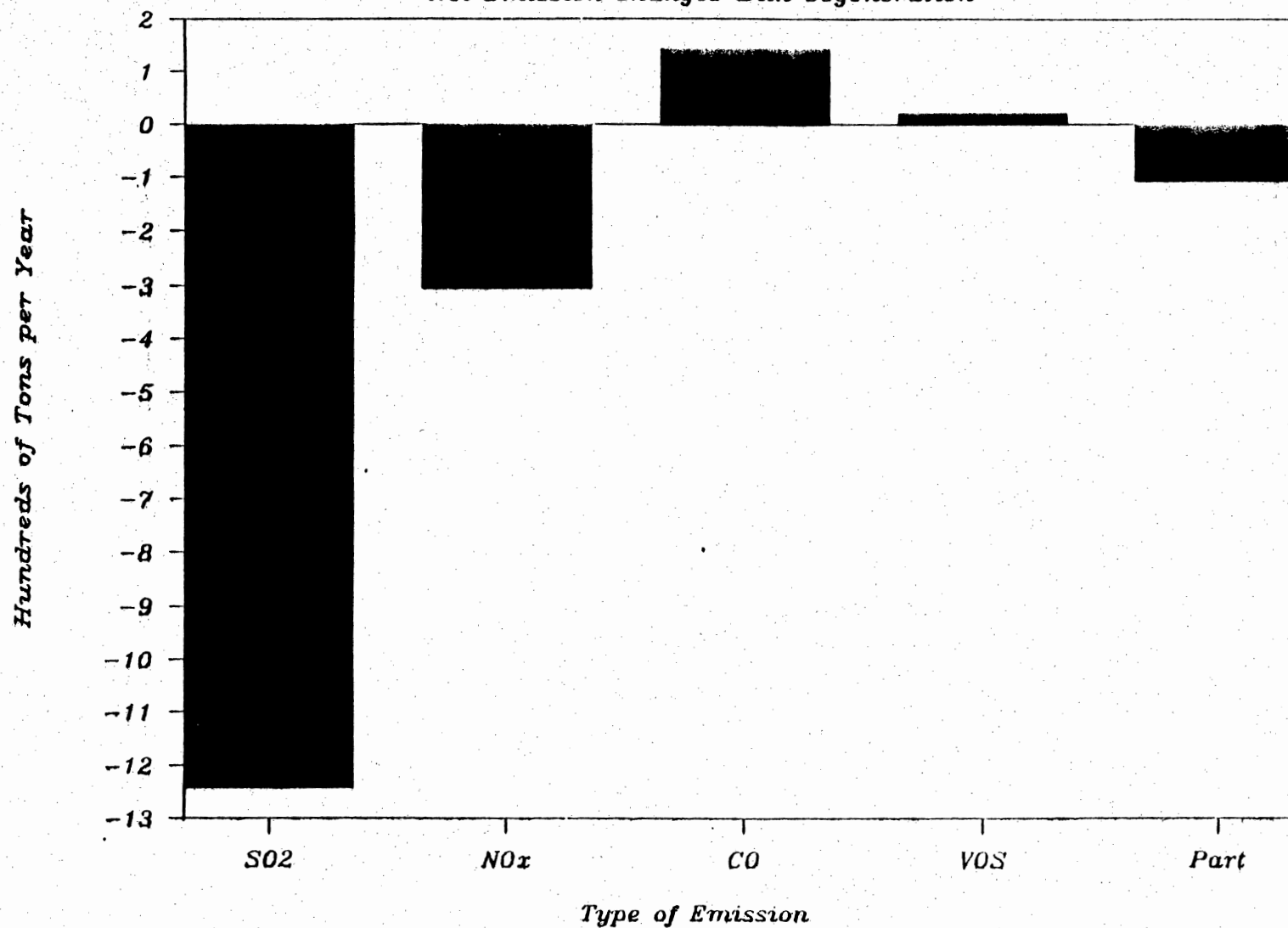
ASSEMBLYWOMAN OGDEN: Thank you, everyone, for being here. This concludes the public hearing.

(HEARING CONCLUDED)

APPENDIX

PAULSBORO

Net Emission Changes with Cogeneration



EXCERPT FROM....

NEW JERSEY ENERGY MASTER PLAN

December 11, 1985

COGENERATION

New Jersey Department of Energy
101 Commerce Street
Newark, New Jersey 07102

CHAPTER 3

RECOVERABLE ENERGY SOURCES

COGENERATION

History and Recent Trends

It is now clear that New Jersey can improve its economy, enhance energy reliability, raise energy efficiency, reduce energy costs, lower pollution, convert solid waste to fuel and promote and retain jobs by encouraging the growth of a "new" source of electric power: cogeneration and small-power production by non-utility energy entrepreneurs. These are terms for a method for coupling electric power generators to factories and institutions with a high steam load or demand for heat—whether an oil refiner or a YMCA—and using the heat to produce electricity that can serve the customer's own needs while selling any excess to the utility.

With cogeneration, consumers who are strapped by New Jersey's high electric rates will find that they can convert this liability into an asset. These high costs will act as a spur to investors eager to assist consumers in the installation of cogeneration equipment. Cogenerated power will then replace much of the high cost electricity formerly generated by utilities, leading to lower costs to all, but especially to those cogenerating. In this way, electric power production statewide will gain new generating capacity without the risks or uncertainties associated with traditional utility power plants.

Cogeneration offers wide-ranging economic benefits statewide as well. Lower energy costs resulting from cogeneration make it more attractive for businesses and industries to locate and to remain in New Jersey. Not only are jobs retained in the state, but a company that is investing in a cogeneration facility is not likely to move to another region.

Encouraging the development of cogenerated power would unlock a huge market for cogeneration equipment and services. According to the New Jersey Department

of Labor's Division of Planning and Research, constructing 500 MW of cogeneration would create 7,500 to 10,000 jobs for masons, engineers, electricians, plumbers, carpenters, and planners as well as 9,700 to 10,000 indirect jobs in trucking, manufacturing, and other support services, for a total of 17,000 to 20,000 jobs.

In addition, cogeneration in New Jersey will increase the yearly consumption of natural gas, which will benefit all gas customers by spreading the fixed costs of pipelines and gas companies over greater sales volumes. Electric consumers, too, will benefit as cogenerated power sold to local electric companies helps to offset the need for large new central power plants and the importation of power from out of state.

To bring this opportunity to fruition, the State must clarify how electric utilities cooperate with this new energy source which also can compete with utility facilities. New rules are needed to harmonize traditional monopoly regulation with the promotion of non-utility power development. Cogeneration and small power production can then fulfill their immense potential for improving the economy and environment of our State.

In the early years of electric power development, cogeneration was widely used in industrial plants. Gradually, however, electric utilities began to grow and absorb non-utility power producers. In part this growth reflected the new technologies of long-distance power transmission which made centralized electric power plants more economic. In part it also reflected actions by utilities with the support of state and federal regulators which would be questioned today as anti-competitive and monopolistic. See, R. Munson, generally, *The Power Makers* (1985) and C. Wooster, "Cogeneration: Revival Through Legislation," 57 *Dickinson L. Rev.* 705 (1983), pp. 707-717.

By 1920 about 30 percent of the nation's electricity was still cogenerated; by 1950, 17 percent was cogenerated. At the start of this decade, cogeneration reached its nadir—4 percent of national production. It is now sharply on the upswing, however, with over 7 percent of the nation's power generated in this manner and much more on the way.

The re-emergence of cogeneration and other non-utility power sources marks a re-emergence of competitive forces in an arena where natural monopolies have reigned supreme. As BPU Commissioner George Barbour described the change: "Competition has entered the markets for many services long regarded as classic natural monopolies," leading to a "partial revolution" that requires regulators to "reexamine policies" grounded on traditional monopoly theories. (G. Barbour, "Public Utilities Regulation: The Opening of a New Era," 116 *Pub. Util. Fort.*, No. 11 (November 28, 1985) at 15.)

Opening the door to cogeneration means rethinking utility regulation. Promoting an entrepreneurial enterprise, such as cogeneration, cannot simply be grafted onto traditional regulation which assumed the necessity for vertically integrated monopolies with exclusive territorial rights (the horizontal monopoly). In this new era of competition regulation must engage in a "step-by-step and balanced approach" in the transition to a more competitive market in electricity and related services. (G. Barbour, *Id.*) The goal of regulators in 1985 and beyond must be to define where natural monopolies end and competitive forces begin, and then proceed to harmonize the two. This is the regulatory crossroad described by Commissioner Barbour and ushered in by the technological advances and changing economics of electric power production.

Cogeneration is an idea whose time has come again. It is a proven and feasible technology which can be readily employed in New Jersey just as it has in California, Texas and other states where energy businesses have flourished alongside healthy electric utility systems. All that remains is for the State to open up the electricity market and allow investors to compete effectively and fairly with utility power sources. This chapter and the specific policies which follow are intended to produce that result. But in the end the fate of the cogeneration industry will lie with the industry itself and its ability to sell its services to New Jersey businesses and institutions which are eager for a way out of continually rising energy bills. All that the State can and should do is to create conditions favorable for cogeneration to develop at its own pace and on its own merits.

One of the primary reasons for promoting cogeneration is that energy costs have become a critical factor in the

ability of states to sustain existing industries and attract new ones. In New Jersey high cost power is an economic concern of the highest priority. Indeed, there appears to be a strong correlation between the level of energy prices in a state and that state's competitive status within the industrial market. *The 1984 Alexander Grant Study, General Manufacturing Business Climates of the Forty-Eight Contiguous States of America* noted that energy costs in New Jersey remained "unacceptably high," despite the fact that New Jersey rose from 47th place to 24th place in terms of overall business climate.

Ownership Options

The ownership and operation of a cogeneration facility can be structured in many ways, which can be expressed into three basic approaches: industrial, joint industrial/utility, and third-party.

Industrial Ownership

In this option the cogeneration facilities are built, owned and operated by the same company or entity which receives the cogenerated power. Both the thermal and electrical energies produced by the system are utilized at the site with excess electrical energy sold to the utility. The majority of the State's existing cogeneration plants fall into this category, including all cogeneration systems which produce mechanical shaft horsepower. Hoffman-LaRoche's cogeneration plant at Belvidere, Warren County is an example of this option. Backup service is purchased from the utility in case of breakdown or scheduled maintenance.

Joint Industrial/Utility Ownership

This option refers to a cogeneration facility owned in part by an electric utility and an industrial partner. The role of the utility may also be assumed by a subsidiary of the utility.

An example of joint ownership is Riegel Paper, where the gas turbine is owned by a subsidiary of NUTEL, the generator by JCP&L and the waste heat boiler by Riegel Paper.

Third-Party Ownership

This ownership option refers to a cogeneration facility which is owned, operated, and otherwise managed by a corporation formed solely for this purpose. Thermal and electrical outputs are sold to another party or parties.

An example of this option is Trenton Integrated Community Energy System (ICES) project, a government-sponsored system owned and operated by the Trenton District Energy Company (TDEC), which is a private concern consisting of Cogeneration Development Corporation of New York City and a number of general partners. Landlords who generate inexpensive cogenerated power for resale to industrial parks or shopping mall tenants also fall into this category.

Financing

Feasibility Studies: The Department has proposed legislation to appropriate funds for site-specific feasibility studies of industrial cogeneration. Coal conversion studies would be funded from this appropriation as well. The Department has already identified more than 2,000 large boilers which are potential targets for cogeneration. Based upon available information from other states with similar programs, site-specific feasibility studies performed by independent licensed engineers range from \$700 to \$30,000. The Department would pay up to half of the cost of each feasibility study, limited to a maximum of \$5,000.

Construction: The New Jersey Economic Development Authority (EDA) was given the legislative mandate to "guarantee up to 90 percent of the amount of a loan to . . . an energy improvement system." N.J.S.A. 34:1B-5(r). Thus, cogenerators are eligible for funding at below prevailing market interest rates. Many small- and moderate-sized businesses will find subsidized interest rates a strong incentive to evaluate the potential for cogeneration.

Potential cogenerators in the main can be expected to turn to traditional lending sources for their investment capital. To do so, however, investors must receive sufficient indication of success if they are to proceed with financing. At present, investors are simply unable to gauge the credit-worthiness of projects in this State due to the unpredictable nature of power sales from the cogenerator to the utility (buy-back rates).

Other economic incentives are available through liberal tax treatment of facilities. These include the investment tax credit and accelerated depreciation allowances. With pending federal tax reform, however, these incentives may soon be ended and cogeneration will be forced to compete even more with other investment opportunities. This likely change in the Internal Revenue Code is further justification for a strong State policy in favor of cogeneration if it is ever to have a chance to develop in New Jersey.

As a rule, economic incentives should not continue indefinitely. Their primary purpose is to provide a sound basis for renewing cogeneration as a means of producing energy. After that, cogeneration must compete on its own merits. Incentives, therefore, must be recognized as short-term benefits which can and should be reduced as the proportion of cogenerated electricity increases. Simultaneously, the liberal tax benefits and related incentives available for the central station generation of electricity should also be phased out so that a truly "level playing field" is created. In the meantime, however, special incentives will be necessary for the re-introduction of cogeneration into the New Jersey economy and energy mix.

In the section which follows the Department sets forth in detail the initiatives that it will undertake to advance cogeneration in the State, the problems faced by this new industry, and the particular solutions that must be employed.

How the DOE Will Promote Cogeneration

The Department will promote the fullest possible economic use of cogeneration in New Jersey in five basic ways.

First, the DOE will continue its public education program.

Second, the DOE will establish a special "Cogeneration Center" at the DOE to assist potential users and developers of cogeneration.

Third, the DOE will work for any legislation needed to end the remaining barriers to cogeneration, so that it can compete on a "level playing field" with utility power sources.

Fourth, the DOE will apply its energy conservation and planning regulations to require utilities affirmatively to plan for the incorporation of substantial amounts of cogeneration and other forms of non-utility, alternative technologies into their supply mix.

And fifth, the DOE will implement this chapter of the Master Plan in every arena of importance to cogeneration, notably in proceedings before the BPU and in the policies of the DEP.

Public Education

On May 23, 1985, over 500 representatives of cogeneration developers, banks, businesses, utilities, and government officials crowded into a room at the Gateway Center in Newark to attend the Governor's Forum on Cogeneration in New Jersey, sponsored by the DOE. Among the companies that discussed their successful cogeneration efforts in New Jersey was Hoffman-LaRoche with its 23 MW Belvidere plant. Other speakers described cogeneration's future as a way to conserve energy, lower electricity bills, and substitute for isolated, single-purpose power plants now in use.

On September 10 and 20, 1985, the DOE held hearings on utility policies regarding cogeneration: gas and electric utilities testified on September 10. On September 20, the DOE heard responses from the cogeneration industry, followed by a concluding session on September 24 due to the overflow of witnesses. These hearings are part of the record in this Master Plan. They have proven to be instrumental in its development.

The DOE plans to hold more seminars, conferences, public hearings and, if need be, investigations, to examine the problems and publicize the promise of cogeneration in New Jersey. These educational sessions will be especially helpful in explaining all facets of cogeneration policies to the public and private sectors alike.

The Cogeneration Center at the DOE

The rudiments of a Cogeneration Center at the DOE are already in place. The Commissioner has pinpointed cogeneration as the leading single initiative of the Department. He has named a member of his staff to work as a full-time cogeneration coordinator. Other offices within the Department devote much of their attention to advancing the cause of cogeneration.

More, however, is needed and clearly justified if this environmentally sound, economic and highly reliable approach to energy efficiency is to reach its full potential. Therefore, in keeping with his power to "organize the work of the Department and [to] establish therein such administration subdivisions as he may deem necessary," (N.J.S.A. 52:27F-8), the Commissioner will establish a Cogeneration Center at the DOE. This center will act as a central clearinghouse for cogeneration opportunities; it will mediate problems and disputes; it will cooperate with the Department of Health in its efforts to cogenerate at the many institutions under its jurisdiction; it will assist the DEP in permit procedures; and, perhaps most important, it will be a full-time advocate for cogeneration in the State.

The Center will also contain a registry of cogeneration projects that will enable it to tabulate the growing cogeneration in the State and to focus attention on projects in need of assistance. In this respect, the center will function much as the Office of Business Advocacy with the Department of Commerce and Economic Development was intended to do—to serve as a proponent of technology with immense potential to benefit the entire State.

Legislation and Lobbying

The Legislature has passed and the Governor has enacted a bill, S-2531 (P.L. 1985 C. 359), which exempts all sales of natural gas to cogenerators from the Gross Receipts and Franchise Tax. This tax, initiated decades ago as a substitute for local property taxes, has burgeoned into a 14 percent sales tax on all electricity and natural gas sold by regulated utilities. But gas sold to electric power companies, for use in generating electricity is exempt from the tax. Thus, electric utilities have an immediate 14% price advantage over cogenerators. By exempting from tax gas sold to cogeneration, the Legislature has helped to level the playing field of competition between potential cogenerators and traditional utility-supplied electricity. In addition, the Legislature has passed and the Governor has enacted another bill, S-2529 (P.L. 1985 C. 26) which exempts cogeneration equipment from sales tax.

The Cogeneration Center will work with legislators and the Governor's office in promoting the best legislation possible. The center will testify, draft bills, organize coalitions, and generally work for the passage of laws needed and justified to further the public interest in a thriving cogeneration industry in New Jersey.

The Energy Conservation and Planning Regulations

Cogeneration and small power production are among the most efficient and dynamic forms of energy conservation yet devised. They include windmills, waste heat recovery, resource recovery and other forms of alternative technologies. Because a cogenerator, in fact, is able to use the same energy twice, cogenerating both heat or steam and making electricity, a cogenerator is also an energy saver of the highest order.

Moreover, as cogeneration replaces the inherently inefficient use of isolated, single-purpose power plants by utilities—seldom even half as efficient as cogeneration—we may see net reductions in the use of certain fossil fuels to make electricity, even if these fuels

used in cogeneration. Recent data show that electric power utilities continue to rely heavily on natural gas or oil to make electricity; yet they waste most of the heat created by the burning of these fuels rather than capturing the heat for dual use, as would a cogenerator. For example:

More than 34% of Atlantic Electric's in-state generation was derived from oil and gas;

Approximately 94% of JCP&L's native generation was oil- or gas-fired;

Some 58% of PSE&G's in-state generation came from burning the same fuels;

And for New Jersey utilities as a whole, about 60 percent of power generated within the State was produced by oil- and gas-fired facilities.

Compared to cogenerating the same amount of electricity through oil or gas, these figures suggest that vital fuels are being used wastefully. A shift to cogeneration and other alternative technologies can change this.

In short, cogeneration can substitute for the burning of oil or natural gas by utilities as part of a comprehensive energy conservation and planning effort. Even if all cogenerators use natural gas, the fuel of choice for cogeneration, there could be a net reduction in fuel used to produce the same quantity of megawatt hours and on-site heat use that would otherwise come from separate utility and on-site heating. In this way we see that promoting cogeneration saves natural gas given the innately more efficient two for one properties of cogenerating heat and electricity.

New Jersey is not the first state to reach this conclusion. The California Energy Commission, for example, has recently published its new energy plan. The Commission counts heavily on cogenerated electricity for much of the State's power needs over the next 10 years. In fact, no new power plants of any kind will be built by utilities in that fast-growing state. See, generally, *The 1985 California Electricity Report: Affordable Energy in an Uncertain World*, C.E.C., P106-85-001 (May, 1985). The Commission tabulates that some 7,300 MW of cogeneration capacity are under contract with utilities; about 2,000 MW are considered "likely to be available" based upon a historical rate of 28 percent of "all identified projects" coming to fruition (*Id.*, at 60, Table 4-5).

In sum, the Department will interpret its Energy Conservation and Planning Regulations (N.J.A.C. 14A:20-1.1, *et seq.*) with the above precepts in mind—namely, that conservation and cogeneration are

interrelated. Each electric utility's energy conservation plan will include, *inter alia*, its evaluation of "programs designed to promote energy conservation through the use of alternative technologies," including cogeneration (*Id.*, at 1.4(a)6). The DOE will then determine if these plans comport with the goals of the regulations and the DOE Act to assure "a secure, stable, and adequate supply of energy at reasonable prices" for the State (N.J.S.A. 52:27F-2). To be approved by the DOE, utility plans must show how they promote cost-effective cogeneration and other forms of energy conservation. Utility plans which do not meet this test will not be approved and will, therefore, be amended. Approved plans, in turn, will be enforced through all measures available by law, including (if need be) judicial injunctions and penalties (N.J.S.A. 52:27F-21).

Implementing This Master Plan

Finally, and perhaps most importantly, this Master Plan provides much-needed guidance for the future of cogeneration in New Jersey. The Master Plan is intended to show other departments and agencies in the State with jurisdiction over cogeneration how to use their power to promote its widespread use without sacrificing other public concerns. How the agencies respond to this plan is, therefore, critical to the success of cogeneration.

Thus, some explanation of the proper role of the Master Plan in the deliberations of other agencies—notably, but not exclusively, the Board of Public Utilities—may be helpful. (These comments would also apply to any other section of the Master Plan.)

The Department of Energy Act authorizes the Department to adopt a State Energy Master Plan which agencies must implement to the "maximum extent practicable and feasible" (N.J.S.A. 52:27F-15b).

This means that, each "State instrumentality" will abide by the Plan as if it adopted this Plan. The only difference may be that agencies are empowered to relax the Plan's demands when it is clearly necessary to do so, based upon evidence that compliance is not "practicable and feasible."

To assist each instrumentality in complying, the DOE may prepare "such guidelines as the Department determines to be relevant" and helpful (*Id.*). Guidelines are offered by the DOE wherever the Commissioner finds a need to provide greater direction and specificity to the Plan than the Plan itself conveys. Since the guidelines are merely explanatory of the Plan, they should be honored in the same way as the Plan itself. The Commissioner has determined that the cogeneration policies

and the textual explanations therein are sufficiently precise that no guidelines are needed at this time. (See *N.J.S.A. 52:27F-15(b)* which grants the Commissioner discretion in resorting to guidelines: "... The Department shall prepare ... such guidelines as the department determines to be relevant to assist each such instrumentality in conforming with said energy Master Plan...")

Cogeneration: Problems and Remedies

Unless stated otherwise, all references here or in any other part of this Master Plan to cogeneration or small power production shall mean the same as the definition of "qualifying facility" or "cogeneration and small power production" adopted by the Federal Energy Regulatory Commission, 18 *C.F.R.* 292.101 and .202.

At the September 1985 hearings on cogeneration, the Department considered basic problems or barriers which inhibit the economic use of cogeneration. After careful deliberation, the Department has determined that the major inhibiting factors are as follows:

1. **Buy-back rates:** The rates offered by electric utilities for the purchase of cogenerated electricity are too low, too variable, and too unpredictable. They also fail to satisfy the requirement of PURPA to offer rates based upon the "full avoided cost" in the long-run of cogeneration as a substitute for power plants owned and operated by electric utilities.

2. **Back-up power rates and access:** Evidence suggests that electric utilities continue to charge rates for back-up power to cogenerators that appear excessive in light of actual experience to date around the country. Pursuant to the Board of Public Utilities Order in Docket 8010-687 (October 14, 1981), utilities were permitted to charge rates based upon an assumed system outage of 15 percent. Experience shows that the outage rate is closer to 5 percent. Excessive rates discourage investment in otherwise feasible cogeneration systems. Now a decision by the Federal Energy Regulatory Commission (FERC) has raised much doubt as to whether third-party cogenerators will have access to back-up power at any price.

3. **Wheeling access and rates:** Electric utilities continue to maintain barriers to non-utility power sources gaining access to transmission lines for the sale of their cogenerated power to utilities in different service territories. These barriers include unpredictable wheeling rates and non-economic restraints which bear little relationship to the burdens and benefits of installing large

quantities of cogeneration on the system. In addition, cogenerators serving more than one facility need to engage in "self-wheeling" in order to take full advantage of economies of scale.

4. **Unequal bargaining power:** Utilities have unfair bargaining advantages over cogenerators due to the monopsony position of the utility (many sellers but one buyer), the greater risk exposure of cogeneration investors, and other factors. Steps must be taken to prevent utilities from taking advantage of their monopsony status, including the use of standard form contracts and incentives/penalties to promote good faith bargaining with cogenerators.

5. **Access to natural gas:** Natural gas is the principal fuel of cogeneration, largely due to its clean-burning properties, which are critical to the location and operation of cogeneration units in urban and densely populated areas. Unfortunately, prospective cogenerators have had great difficulty in securing adequate supplies at affordable prices.

6. **Environmental permit procedures:** Potential developers have complained of difficulty in gaining necessary air pollution and related permits from the Department of Environmental Protection. They also fear the exaction of unreasonable air pollution requirements that may make cogeneration uneconomic.

7. **The future of cogeneration in a power-glutted market:** There is a persistent concern that cogeneration may be stifled by the continuing, and in some cases growing, glut of uneconomic but utility-owned electric power generating capacity. This concern arises even though cogeneration can supply large amounts of power at rates that are cheaper than much utility capacity, even though cogeneration can reduce net pollution and net energy use, and even though it promotes a more reliable electric power system. This concern is especially pressing in the case of the PSE&G service territory, where much of the State's cogeneration capacity is found.

8. Miscellaneous Concerns:

(a) Evidence indicates that some utilities do not always negotiate in good faith. Regulation is needed to assure good faith efforts to conclude contracts.

(b) To assure least-cost energy for consumers, cogenerators should be allowed to "bid" to displace more expensive power sources, including utility capacity.

(c) While utilities should be permitted to enter the market for cogeneration development, special safeguards are needed to protect competition.

Buy-back Rates for Cogeneration and Small Power Production

One of the thorniest issues of cogeneration is how to compute the buy-back rates for cogenerated power. Many articles and journals have addressed this question, as has virtually every state regulatory commission in the nation, leading often to varied and creative approaches. (See, e.g., C. Wooster, "Cogeneration: Revival through Legislation?" 87 *Dick. L. Rev.* 705 (1983); W. Collins, "Electric Utility Rate Regulation: Curing Economic Shortcomings Through Competition," 19 *Tulsa L. Jour.* 141 (1983); M. Yokell and D. Marcus, "Rate Making for Sales of Power To Electric Utilities," 114 *Pub. Util. Fort.*, No. 3, Aug. 2, 1984, 21-28; J. Schillaci, "The Simultaneous Buy and Sell Provisions of PURPA Section 210 Regulations," 106 8 *Pub. Util. Fort.* No. 8 at 43-45; S. Silverstone, *PURPA Provisions on Cogeneration and Small Power Production* (1980); "The Appropriateness and Feasibility of Various Methods of Calculating Avoided Costs," B-141 (1982) (Draft document, National Regulatory Research Institute); R. Lock, "Statewide Purchase Rates Under Sec. 210 of PURPA," 3 *Solar L. Rep.* 419 (1981); "Calculating Capacity Costs in Cogenerated Rates," 108 *Pub. Util. Fort.* 57, 58 (Sept. 24, 1981); Stirba, et. al., "Implementing PURPA: the Selection of an Appropriate Methodology," 6 *Journal Energy Law and Policy* 91 (1985); and Yokell and Porter, "You Can Avoid Pitfalls in the Sale of Cogenerated Power," *Cogeneration*, 31, Sept.-Oct. 1984. See also, R. Munson, *The Power Makers*, Rodale Press, 1985, and C. Flavin, *Electricity's Future: The Shift to Efficiency and Small-Scale Power*, World Watch Paper 61 (1984) for a broader discussion of the future role of cogeneration.)

How much is a utility required or allowed to pay a cogenerator for electricity sold to the utility? The Public Utility Regulatory Policies Act (PURPA), passed in 1978 as part of the National Energy Act, requires utilities to pay cogenerators at a rate no lower than the "full avoided cost" (FAC) of the utility (PURPA, Sec. 210, 16 U.S.C. 824a-3 (1982); and FERC regulations, 18 C.F.R. 292.101(b)(6)(1985). In addition, the purchase rate must be "just and reasonable to the electric consumer . . . and in the public interest," and "[n]ot discriminate against qualifying cogeneration and small power production facilities" (*Id.*, at (a)(i) and (ii).

The FAC is defined by FERC as "the incremental costs to an electric utility of electric energy or capacity or both which, but for the purchase from the [cogenerator], such utility would generate itself or purchase from another source" (18 C.F.R. 292.304 (b)(4) (1985). Interpreting these and other regulations has led to a nearly constant stream of litigation, culminating in three United States Supreme Court decisions which appear now to have settled the issue at least enough for development to proceed. These critical decisions are:

F.E.R.C. v. Mississippi, 456 U.S. 742 (1982) [Supreme Court upheld the constitutionality of PURPA, in particular the decisional duties imposed on state regulatory commissions]; *American Paper Institute v. American Electric Power*, 461 U.S. 402 (1982) [Court upheld FERC's "full avoided cost" formula and interconnection rules against challenge by three utilities.]; and *Consolidated Edison Co. v. New York Pub. Serv. Com.*, 53 U.S.L.W. (1985) [Court dismissed Con Edison's challenge to the constitutionality of a minimum purchase rate for cogenerated power of 6c per kilowatt-hour set by legislation which may exceed the true avoided cost, if set pursuant to FERC rules.]

The *Draft Energy Master Plan* (March 1985) requires the BPU to set rates which "are equal to the fully avoided costs of capacity (present value of new baseload plant) and energy (current average generation expenses of each utility's oil and gas units)" (*Draft Energy Master Plan*, at 132, 135). This approach has been criticized as combining "apples and oranges" because the cogenerator should receive energy payments based on the energy costs avoided by the baseload power plant also avoided. (*In the Matter of the Public Hearings In Re: Draft of the 1985 Energy Master Plan*, September 10, 1985, Statement of B. Parent, at p. 28 [hereafter "Tr." followed by p. number and date]). Since the DOE believes that the appropriate avoided power plant is a "proxy coal plant," the avoided energy cost should be that of coal, not the more expensive oil or gas. It has also been criticized for deviating from the current policy of the BPU, which is to require utilities to negotiate with each cogenerator the costs of purchasing power from the Pennsylvania-New Jersey-Maryland (PJM) grid plus a 10 percent add-on (commonly referred to as "PJM plus 10") for the energy component, and the PJM capacity deficiency payment for the capacity component. *In the Matter of the Consideration and Determination of Cogeneration and Small Power Production Standards Pursuant to the Public Utility Regulatory Policies Act of 1978*, Docket No. 8010-687 (October 14, 1981), at 3 (hereafter "Board's Order") ["We further believe that the setting of avoided energy cost at 10 percent above the PJM billing rate will help to adequately promote cogeneration and small power production in New Jersey. . ."].

The DOE believes that a response to these criticisms is in order. It is important to begin by stating the fundamental steps in determining the FAC as contemplated by the DOE.

The Full Avoided Cost is the Sum of the Capacity and Energy Components

Using an incremental, or long-run, approach to FAC requires that we consider the ability of cogeneration to

replace or defer the construction of new utility owned and operated power plants. (Yokell and Marcus, "Rate Making for Sales of Power To Electric Utilities," 114 *Pub. Util. Fort.*, No. 3, (August 2, 1984) at 22 (hereafter "Yokell and Marcus"). If cogeneration in the aggregate replaces or delays the construction of a large coal or nuclear power plant, consumers may see a net, long-term reduction in their incremental rates. Rates will be lower than they would have been but for cogeneration, although cogeneration may not reduce rates below their present level.

With cogeneration development total electric power generating capacity will increase without corresponding investments by electric utilities or their ratepayers. Cogeneration also provides other tangible and intangible benefits which do not always show up in consumers' rates. Also known as "positive externalities," these benefits include improved system reliability and efficiency, reduced air and water pollution, and a shift in risk-taking from utility ratepayers to cogeneration investors. (See Flavin and Wooster, generally, and see also Morris, "The Upcoming Boom in Cogeneration," 115 *Pub. Util. Fort.* No. 11, 17-19, (May 30, 1985).) These factors help to explain the federal directive that buy-back rates for cogeneration be set on the basis of the "incremental costs" to the utility (18 C.F.R. 292.304.)

The DOE interprets "incremental costs" to mean the capital and energy costs combined of a utility constructing and operating its own new power plant. This view accords with the great majority of jurisdictions and reviewers who have concentrated on this question and resolved it independently, (Wooster, 87 *Dick. L. Rev.* 705, 735-57, *supra*, for a state-by-state listing.)

The question, therefore, devolves into two parts: What will be the capital or capacity component and what will be the energy component of the rate to be paid to cogenerators?

Capital or Capacity Component

Two general methods have been identified to this problem: the Differential Revenue Requirement method (DRR) and the Proxy Unit Approach (PUA) (Yokell and Marcus, *supra*, at 23).

The DRR mirrors what a utility would do in calculating the value of a cogenerator's electricity sales. Essentially, it directs the regulatory authority to find the revenues required under a hypothetical "optimum generation expansion plan over a selected period" assuming no contribution by cogenerators. Then perform the same calculation after "forcing the [cogenerators] into the plan at the assumed time" (*Id.*). Next, subtract the revenues required under step 2 from those required

under step 1. This represents the financial value cogeneration to the utility. Contracts can then be awarded based upon an applicant's share of the capacity allocated to cogeneration in the utility's expansion plan. The DRR has been favored by most utilities.

Practical flaws in applying the DRR approach render it virtually useless to regulators. Foremost among these is the inherent dependence of DRR on a battery of assumptions and data that are often subjective and large in the utility's sole control. Even if regulatory officials possess the rationale of each utility assertion, it would be burdensome and difficult, to say the least, to test the basis and accuracy of each utility calculation on a timely basis. Presumably, the reports filed by utilities under 18 C.F.R. 292.302(b), requiring annual avoided cost reporting "on a cents per kilowatt-hour basis" might reflect the data to be used in a DRR approach but the task of verifying data is enormous. (See *Pub. Serv. Coord. Transp. v. State*, 5 N.J. 196, 217-219 (1955) in which the New Jersey Supreme Court admonished the State PUC to probe all data provided by regulated utilities rather than accepting them as true.) Before the task of verification, probably through the adversarial and public hearing method, could be completed, the data would be rendered stale and the process might have to start anew. Meanwhile, much cogeneration would be left in abeyance awaiting the outcome. The DOE, therefore, rejects the DRR method at the present time due to these practical considerations, despite its obvious appeal as a theoretically more thorough and rigorous approach to determining cost-avoidance.

The Proxy Unit Approach (PUA) avoids many of the pitfalls. It is also so simple that most major calculations can be performed on a hand calculator by anyone who understands the basic elements of utility operations" (Yokell and Marcus, at 23). The PUA looks simply at a hypothetical power plant—assumed to be replaced by many cogenerators—and the costs of financing, building and operating that unit. (Compare this method to the difficulties in examining the entire utility expansion plan over several decades of the DRR.) The PUA allows the regulatory officials to break the question down into the relevant, manageable parts, such as

- What is the proxy unit? (e.g., fuel, size, location, operating characteristics, etc.)
- What is the timing of the proxy unit? (e.g., when would it be needed but for the cogenerators?)
- How much will the proxy unit cost?
- How reliably would this proxy unit operate?
- What is the present value of avoiding this proxy unit which can therefore be awarded to the cogenerators and form the basis for their compensation?

Determining The Proxy Unit

There are at least four ways to decide on the proxy unit. Each has several problems, but one has benefits that ultimately outweigh its difficulties.

The Utility's Most Recently Completed Unit: The obvious benefit of this approach is that it yields objective and specific numbers. All can see the costs actually incurred and passed on to ratepayers in the last power plant built. The problem is that the newest power plants built by New Jersey's electric utilities, except for Rockland Electric, have been nuclear power plants. Hope Creek, at \$3.8 billion or higher, is so costly that if it is used as the basis for cogeneration planning, excessive buy-back rates might be produced. No New Jersey utility is likely ever again to spend so much on a single power plant, with or without cogeneration. More cogeneration than is justified could be stimulated, and ratepayers might pay rates that are unjust.

The Utility's Next Power Plant: The benefit of this proxy unit is that it may actually conform to the facility that cogeneration will displace. This proxy unit has much certainty and realism to it. However, it leaves too much within the discretion, control and judgment of the utility which may have a strong interest in deterring non-utility power sources within its service area. A utility could stifle the growth of cogeneration simply by altering its demand forecasts and resource plans at will. It might publicly plan on no more power plants for the foreseeable future and assign a "zero" value to cogeneration. Then when cogenerator investors are deterred from competition with the utility, it can reverse itself if need be and resume planning for a power plant or power purchases which healthy competition from cogeneration might have avoided. This approach, therefore, suffers from a potential for "bait and switch" manipulation that renders it unfair and unreliable.

The Utility's Next Unit After Certification by the DOE: This approach borrows from the preceding approach, but it has the balancing effect of an outside review by the DOE that will require each utility to submit detailed plans for energy conservation (N.J.A.C. 14A:20-1.4 through 1.8). Once the DOE has reviewed and approved the utility plans, it may then certify them (*Id.* at 1.9). In this way, a finding may be forthcoming as to what the appropriate avoided power plant will be with respect to each utility. The advantages to this approach are numerous. DOE reviewers can determine on a utility-specific basis what is the optimum plan for that utility. How much conservation investment should the utility plan to accomplish? How much will this defer the need for power generation or purchase, whether from PJM or from cogenerators? Clearly, such a planning process can work. However, it may not be suitable to the singular purpose of identifying a proxy unit and the

consequent setting of avoided cost rates to be paid to potential cogenerators. Delays can be expected in the process of preparing, submitting and reviewing of utility plans. These delays could forestall otherwise justified cogeneration development.

More to the point, this planning process is directed primarily toward the promotion of conservation, particularly in the residential sector; it is still the least costly, most environmentally sound form of energy development (Draft Master Plan, at 157, 173). It would be anomalous if promoting residential conservation should serve to bar, even temporarily, the cost-effective development of commercial and industrial cogeneration. Both merit support and devoted attention. And, since much of the conservation initiative will be limited to residential and small commercial ratepayers, it is only fair and proper that cogeneration should proceed at its own legitimate pace, given its strong benefits to industrial and large commercial users who have had to fend for themselves in coping with rising electric rates.

In due course, the DOE believes that it will be able to fine tune the planning process so that the cogeneration and conservation initiatives are effectively merged. The conservation regulations contain many inducements to cogeneration that will directly benefit this effort as well. Nevertheless, until such time, the DOE finds that there is a clearly preferable methodology.

The Hypothetical Statewide Power Unit: The most practical approach to a proxy power plant is to determine the hypothetical power plant on a statewide basis exclusive of statewide conservation developments. Such a pragmatic approach recognizes the statewide regulation and interconnectedness of the investor owned power companies. It also reflects the regulatory simplicity of identifying one unit that would, in fact serve all the users of the State at varying times due to power exchanges and interconnections. Furthermore, it removes the opportunities for a utility to "bait and switch" and eliminates the delays and regulatory expense of engaging in laborious company specific assessments of power plant investment decisions that are still several years away.

What is New Jersey's Statewide Proxy Power Plant?

As stated in the March, 1985 Draft Master Plan, the DOE is convinced that the appropriate statewide proxy unit is a hypothetical baseload coal-burning power plant. When it is needed could be the subject of debate. (See, e.g., the Electric Facility Need Assessment Act, N.J.S.A. 48:7-16, et seq.) Historically, State regulators have had little involvement in formal reviews of the need

for new facilities. The related question of timing, i.e., when a power plant justified for billing to consumers and bringing into operation, has received only minimal attention as a rule. Thus, it would seem anomalous to apply a stricter standard to small, non-utility facilities than was applied to large, utility units over the years. Nevertheless, new facilities can be justified and, indeed, are needed whenever they will reduce electricity costs, lower acid rain deposition from State dependence on out-of-state coal plants or generally enhance system reliability.

A review of the existing installed capacity of the New Jersey utilities indicates that as of December 31, 1984, it was 13,278 MW. However, significant amounts of firm capacity purchases are presently being made by ACE and JCP&L. As of December 31, 1984, these firm purchases were about 1,400 MW. Some of these purchase contracts will start expiring in 1992 over a nine-year period. In order to continue providing adequate service, the utilities would, absent massive conservation and cogeneration programs, need to build new facilities. The most likely candidate for this capacity expansion would be a coal-fired plant in the size of 600 MW.

It might be expected that this plant would burn primarily low sulphur coal at 1.5-3.5 percent sulphur content in order to conform with New Jersey's strict air pollution control limitations. (See, e.g., N.J.A.C. 7:27-7.1, *et seq.*; sulphur content; 7:27-10.1, sulphur in coal; 7:27-5.1, general prohibitions, 7:27-8.1, permits and certificates; 7:27-13.4, ambient air quality standards for sulphur dioxide, and 7:27-3.1, further controls on combustion of fuels.) It would also be equipped with scrubbers and other air emission elimination systems, consistent with the requirements of the "State Implementation Plan" adopted by the DEP. N.J.A.C. 7:27-13.2(a)-(c).

Such a plant could be installed in 1992 at a cost of approximately \$1,900 per KW in current dollars. In order to compute the capacity payments for this proxy plant in 1992 to be paid to a cogenerator in 1986, the DOE suggests using the methodology developed by the State of Florida. Under the Florida methodology, monthly capacity costs in dollars per KW are calculated for the proxy unit. The savings associated with deferring this unit for any length of time is then calculated, and this amount is paid out to the cogenerator over the life of the cogeneration contract. With this technique, for the New Jersey proxy plant to be built in 1992, a cogenerator in 1986 would receive a capacity payment of \$12.27 per KW per month for a 10-year contract. This translates into approximately 2.4¢ per kwh for a 70 percent capacity factor.

The Energy Component

Logically, it would seem that the energy component of the proxy power plant should serve as the basis for compensating the cogenerator for energy actually delivered. If the cogenerator displaces a unit of coal power plant, then both its capacity and energy payment schedule should be based on the same unit. This reasoning formed the heart of comments by the BPU and PSE&G. They referred to the DOE's proposal that cogenerators be paid for capacity based upon a baseload coal unit and for energy based upon a gas or oil-fired peaking unit as an "apples and oranges" approach.

The DOE remains convinced that there is a sound basis for combining apples and oranges, yielding in this case an energy "salad" for the residents of New Jersey. This is so for the following reasons:

—As a rule, cogeneration facilities burn oil or natural gas. Since cogenerators must purchase these relatively high-cost fuels, they deserve to be paid for their effort just as a utility "passes through" its fuel costs (*In the matter of Redi-Flo Corp.*, 76 N.J. 21 (1978)). Also, if they are ever to compete "on a level playing field" with utility power plants, they may require temporary incentives. This incentive factor both compensates for incentives routinely given to utilities and recognizes the many intangible benefits of cogeneration. Indeed, in the BPU's original orders of 1981 in Docket No. 8010-687 regarding the buy-back rates for cogeneration, the Board added a premium of 10 percent to the PJM billing rate—hence PJM plus 10—expressly due to these external benefits ("[W]e are of the opinion that there is intrinsic value to smaller, decentralized cogeneration and small power production facilities." *Board's Order*, at 4.) Since 1981, the public has come to appreciate that these benefits include: exceeding their previous estimates. They include burning alternative fuels; using energy more efficiently; enhancing reliability for electricity supply; reducing consumption of oil or natural gas by electric utilities; increasing economic security for industrial and commercial ratepayers; lowering acid rain in the State; and the secondary benefits of having a thriving "emerging technologies" industry in the State (See J. Cannon, *Acid Rain and Energy: A Challenge for New Jersey*, [Informa Inc., 1984]. For a report on one state's efforts in this regard, see *The 1985 California Electricity Report: Affordable Electricity in an Uncertain World*, Cal. Energy Comm., P106-85-001, at 143.)

—New cogeneration facilities replace both peak and baseload units. Given the short lead-time for constructing and installing cogeneration facilities, they offer the promise of substituting for high cost power generation of all types in a very short period. For the next few years, cogeneration investors can quickly displace

otherwise uneconomic power generation and purchases. In so doing, the current price of oil and natural gas is the appropriate avoidance standard for compensating these investors, especially given the continued dependence of utilities on natural gas and oil as fuel sources at power plants in-state. Eliminating these inefficient and uneconomic uses of prime fossil fuels should be a leading objective of the State.

The Department recognizes that setting the avoided cost rate must also take into consideration the interests of non-cogenerating ratepayers. If cogeneration can be stimulated at a lower rate, then all public interests are better served. This balancing factor is well recognized (See e.g., 18 C.F.R. 292.304(a)1). ("Rates for purchase shall . . . [b]e just and reasonable to the electric consumer of the electric utility and in the public interest.") Consequently, the Department has determined that the energy component shall be that of the most efficient baseload oil- or gas-fired steam units.

The Department agrees, however, that the energy component should be reduced to the avoided energy of a baseload proxy unit as of the date when that power plant theoretically would be needed. In other words, if the coal unit is assumed to be needed, but for cogeneration, in 1992, then as of 1992 the energy component should be based on a coal plant in that same year.

In this way the DOE has created a kind of "two-tier" pricing policy. In the first tier are cogenerators who respond swiftly to this Master Plan, sign contracts, and otherwise serve as pioneers for those who will follow. (Pennsylvania calls this a pioneer rate). Being among the first should merit special consideration. Those who follow will reap the benefits of their successes. They will find an easier regulatory path, assuming their product is competitively priced. Accordingly, those who invest after 1992 should receive an energy rate equal to avoided coal-fuel costs in the same year. Non-utility power producers in operation before that year will receive the premium rates based upon oil or natural gas steam units until that same year.

An Alternative: Locked-in PJM Rates

The electric power utilities, as stated, continue to support retention of the Board's pricing policy announced five years ago. This policy reflects a spot-market approach which has slowed cogeneration investment in the State. It may be, however, that one of the most basic flaws in this approach—its unpredictability—can be corrected. Since utilities routinely project future trends in the PJM billing rate, as central to their planning for new facilities, there is no reason why cogenerators should not also enjoy the benefits of that forecasting. The trend

lines for the PJM billing rate could serve as the trend line for cogeneration buy-back rates. This would alleviate much of the unpredictability in the 1981 BPU order. A cogenerator should be able to choose a locked-in trend in the projected PJM billing rate, just as a utility relies on this information to foreshadow its investment decisions.

Accordingly, cogenerators may select a contract for buy-back power rates using the "ramped-up" PJM billing rate for the energy component as the formula for their compensation. Whether the 10 percent premium should be increased, as seems likely, is another question. Such an option may be simpler than the proxy unit method; it also may be faster than the PUA. It will, in any event, be up to the cogenerator to choose.

Summary

The State must alter its pricing policies to attract and retain cogeneration investment. Therefore, the DOE adopts a two-tier pricing plan, using the proxy coal unit for capacity costs together with the energy cost of a baseload oil or gas unit until 1992, when it will shift to the avoided energy cost of the same coal unit. Alternatively, a cogenerator may choose to use the PJM billing rate (plus some appropriate premium, 10 percent under the BPU's 1981 orders) that is locked in to a projection of the future PJM billing rate. This rate will be likely to escalate in keeping with rising PJM billing rates; therefore, it is also a ramped up rate that will guarantee an increasing revenue stream to a cogenerator, provided it performs to expectations.

In fashioning these rates, the State must be careful to provide incentives only where cogeneration actually takes place. The Department therefore proposes that the rates described in this Plan apply only to power supplied by cogenerators to utilities beyond a cogenerator's own needs. Cogenerated electricity must be based upon the principles of thermal dispatch of power. Naturally, any rates established under these criteria must be fair to existing customers, include a consideration of the long-term reliability of the qualifying facility and cover the cost of any transmission enhancements required to interconnection.

Back-up Power Rates and Access

Few industries would invest in cogeneration without the availability of the utility's electricity when the cogenerator needs repair. Historically, refusal to deal with cogenerators enabled the utility industry to drive them out of business (Wooster, 87 *Dick L. Rev.* 349).

at 712-14). PURPA and the regulations of FERC now guarantee that utilities must not discriminate against cogenerators in the sale of back-up, maintenance, supplemental or interruptible power (16 U.S.C. 824 a-3(b), and 18 C.F.R. 292.305). Of special note, FERC regulations and the BPU's orders prohibit utilities from projecting that all cogenerators will be off-line at the same time, a technique used in the past to charge them an excessive demand charge (based on the fiction that the utility will reserve capacity for their use at all times, even when not needed) (18 C.F.R. 290.305 (c) (1)).

The BPU's 1981 orders authorized a demand charge predicated on the assumption that cogenerators as a group would be off-line 15 percent of the time. (See p. 6 of the October 14, 1981 order which describes the Board's "assumption of diversity" of 15 percent at the generation level.) More current experience, however, shows that even this rate is too high. Nationally cogenerators have a group outage rate closer to 5 percent. Therefore, barring any experience to the contrary unique to New Jersey, the State should use this lower figure in calculating back-up power rates. Doing so also conforms with the caveat in the BPU's original order that "such charges and their underlying assumptions should be reviewed as soon as more data is available." (*Board's Order*, p. 6.)

Unfortunately, a recent decision by FERC undercuts this protection for many cogenerators. In the *Alcon* decision, FERC ruled that the utility must supply back-up power only to the actual owner and operator of the cogeneration equipment, but not to the industrial customer of the cogenerator (*In the matter of P.R.E.P.A. (Alcon)*, FERC Docket No. QF 84-147 (1985). Over a third of all cogeneration is the product of third-party financing and operation where cogeneration specialists, taking advantage of tax incentives, operate the facility for the industrial purchaser of the steam and electricity. The *Alcon* decision could stifle third-party investment.

There is a simple way to avoid the harsh and restrictive nature of the *Alcon* case. State regulatory officials can order utilities *under state law* to provide full back-up, supplemental and maintenance power at affordable rates to third-party cogeneration (See, e.g., *N.J.S.A.* 48:2-13, -16, -23, -24, and -27). Utilities in New Jersey must provide such nondiscriminatory service at fair rates to all cogeneration facilities, regardless of who in fact owns title to the hardware or operates the equipment.

Besides the rates to be charged for cogeneration back-up, there is much concern over the non-economic aspects of gaining access to the utility system. The industry complains of long delays by utilities, indecisive and unresponsive negotiations, refusals to interconnect with the

utility's network, high costs to interconnect, unreasonable and repetitious demands for safety and compatibility assurances, and other forms of apparent passive resistance (See, e.g., Transcript of September 20, 1985, statements of J. McNair, pp. 127-28; R. Toppe, p. 147; J. Barnes, p. 161, 162). These problems can be as discouraging to investors as the economic difficulties described above.

Accordingly, the Department and the BPU will order utilities to cease and desist from any behavior that unreasonably delays or frustrates a cogenerator's request for access. The BPU will assist in the identification and prevention of any form of stalling tactics, recalcitrance or anti-competitive behavior. Much of this problem, it is expected, will be resolved in the standard offer contracts which a cogenerator will be entitled to sign and enforce against the utility, and in other protection against bad faith bargaining.

Wheeling Access and Rates

Control over transmission lines has helped electric power utilities to eliminate competition by public and municipal systems. (Indeed, a crucial development in the history of the electric utility was the invention of long-distance transmission. See, e.g., R. Munson, *The Power Makers*, 50-52.) Such concerns motivated the U.S. Supreme Court in *United States v. Otter Tail Power Co.* to order a private utility to allow a municipal utility to transport power across its franchise area using its transmission network, even though the two were *de facto* competitors (410 U.S. 366, 377 (1973)). (The Supreme Court relied upon the finding that "Otter Tail has a 'strategic dominance in the transmission of power in most of its service area' and that it used this dominance to foreclose potential entrants into the retail area from obtaining electric power from outside sources of supply" (See discussion of *Otter Tail* as a classic example of the "bottleneck monopoly" in "Refusals to Deal by Vertically Integrated Monopolists", 87 *Harv. L. Rev.* 17 (1974).)

In the same way, utilities have a long history of using transmission line monopoly to stem the entry of potential non-utility competitors—namely, cogeneration and small power production—into their service area (Munson, *supra*, 55-71). Some journal writers now believe that the only "natural monopoly" remaining in electric power lies in the long-distance transmission of electricity at high voltage (Cohen, "Efficiency and Competition in the Electric-Power Industry, 88 *Yale L. Jour.* 15 (1978), 14-18, citing numerous authorities, which recognizes the continuing "economies of scale in bulk-power supply" as contrasted with the increasing diseconomies in large

scale central station power generation.) Typically, the situation arises where an industrial firm seeks to generate its own power and sell the excess to the local utility; when this request is denied, the factory may try to sell the output to another utility or to buyers outside the service territory. Typically, as well, this request to wheel the cogenerated power has been denied or subjected to onerous conditions and uncertain rates.

PURPA and implementing FERC regulations, however, show that Congress intends for cogenerators to be able to sell their power to other utilities through fair access to wheeling services (18 C.F.R. 292, 303 (b), (c) and (d)). But much discretion remains in FERC and at the state level as to what the wheeling charges may be and how to resolve other wheeling controversies. At least one state, Texas, has assumed complete control over intrastate wheeling (*Cogen Rept.*, Oct. 11, 1985 at 5). In New Jersey and most states, however, wheeling rates may be subject to FERC regulation.

Often as important as wheeling charges is whether the wheeling utility may assume line losses in the wheeling contract. In the typical utility-to-utility wheeling, power is brought in from afar and some line loss might be expected as the local utility picks up the power at its border and transmits it elsewhere.

Since cogenerators export rather than import power, the situation is reversed. In most states which have considered the issue, it is recognized that cogeneration results in negative line losses. That is, the additional increments of non-utility power added to the lines help to offset line losses otherwise experienced by the utility. Cogenerated power is generally produced at a location which is closer to the load than the utility's power plants. When cogenerated power is wheeled, electrons are not transmitted to the far-away purchasing utility. Instead, they are fed into the grid, and power is delivered to the purchasing utility. If the cogenerator is located close to major load usage in the transmitting utility's service territory—usually the case, especially in densely populated and heavily developed New Jersey—the added power will reduce overall line losses as if it were sold to and used by the host utility.

The line loss issue is often crucial. A utility can experience a 5 percent line loss in transporting power from its border to another utility; but if a comparable level of cogeneration is near a large load, the utility should expect a savings of approximately 5 percent. Instead of being charged for line losses, therefore, cogenerators in this situation should receive a credit.

Two New Jersey-based utilities, PSE&G and JCP&L, have expressed a willingness to wheel on certain conditions. ACE however, and to a lesser extent JCP&L,

have raised the contention that the State should not require wheeling by a utility on a long-term or firm basis. ACE argues that its transmission system was built for and paid for by its franchise customers and they must have first priority. ACE also argues that its transmission lines are already loaded at 98 percent of its capacity on a year-round basis. If so, then it appears certain that ACE, located in a fast-growing area, will need to expand its transmission capacity in any event. Cogenerators as a class can reduce loading on bulk power transmission lines if they export power or engage in simultaneous buy-sell transactions in which no power is exported to the grid. Thus, a transmission capacity credit would seem particularly appropriate on ACE's system.

ACE's argument that its transmission capacity was built for and is being paid for by its franchise customers misses the point of wheeling services to cogenerators, also among their customers. Wheeling can reduce the costs of transmission services otherwise absorbed by other ratepayers because cogenerators should pay their fair share of transmission capacity. In this respect, if ACE or any other company fails to provide wheeling services when capacity is available, it imposes unnecessary costs on its other customers.

Furthermore, it appears incongruous to deny wheeling services to cogenerators that will provide power efficiently, reliably and within the State while providing such services to out-of-state utilities—which is routinely done through PJM interaction. JCP&L imports 70 percent of its power requirements and ACE has contracted for large power imports from Pennsylvania Power & Light; much of this power could be provided in-state through efficient cogeneration that also may reduce acid rain from Pennsylvania coal plants. In-state cogeneration that can wheel from one utility to the next will help right these imbalances.

Setting wheeling rates may be the province of FERC, but there is every indication that the federal regulators will defer to proposals by the states. The methods employed in Texas are noteworthy and may be applied in New Jersey. Two approaches that were debated were a boundary method and a megawatt mile approach. Reportedly, the Texas PUC arrived at a hybrid method that will provide some compensation to all affected utilities and at the same time provide for a stable, easy-to-calculate and verifiable approach.

The New Jersey BPU will be called upon to adopt without delay a similarly definite and fair method of determining wheeling rates and terms of service. In its 1981 order the Board directed that "[a] Phase II proceeding be established to consider the issue of wheeling within the State of New Jersey." *Id.*, p. 11. On November 13, 1985, the BPU called together various electric

utilities for a conference to begin discussion of a BPU wheeling policy.) The goal must be to establish a statewide market for cogenerated power that allows it to be used where it is most needed. In addition, cogenerators should be permitted and encouraged to engage in self-wheeling in which they wheel power from one or more facilities to multiple customers. In this way the most optimally-sized cogeneration system can be constructed and put into operation without running the risk of being charged excessive wheeling rates or being declared a public utility.

Unequal Bargaining Power and Standard Offer Contracts

An electric power utility is both a monopoly and a monopsony. It is a monopoly because it is the only company authorized by law to generate and sell electricity to other customers within a designated service territory. It is a monopsony because by law all non-utility power providers are limited to selling all their excess power to the same utility or risk being declared a public utility (Hamilton and Bros, "The Need for Standard Contracts and Prices for Small Power Producers," 115 *Pub. Util. Fort.*, No. 11, May 30, 1985, 24-32).

Such a position of power—as the sole buyer and seller—creates an unequal bargaining situation which can frustrate and stifle the entire cogeneration effort. The monopsonist utility can raise entry barriers through subtle exactions, called transaction costs. It can, for example, discourage cogeneration by engaging in drawn-out contract negotiations requiring time and expensive expert assistance; the utility's time and costs will be passed on to ratepayers, but the cogenerator must bear its own. The utility can say it is eager for cogeneration, but it can rotate negotiators, so that each one must start the process anew; or it can send negotiators who lack expertise or the authority to close a deal. By imposing unfavorable take-it-or-leave-it contract terms, the utility can simply dictate its own bottom line all too often.

Such monopsony abuses are not merely theoretical; they are actual and historical. They were at the heart of the *Otter Tail* decision, discussed earlier, which found the utility's practices to be in violation of federal anti-trust laws. They were also singled out repeatedly and frequently by cogeneration witnesses in hearings before the DOE as characteristic of their own experiences (See, e.g., Tr. statement of P. Maistro, p. 213). Thus, it is imperative that clear, enforceable and definite measures be in place if we are to even the bargaining positions of the utility and the would-be cogenerator and reduce transactional barriers to a minimum.

The best approach to correcting these problems is to establish standard offer contracts. This approach is used in California with unprecedented success; it is also the approach favored by journal writers and by the cogeneration industry (Hamilton and Bros, *supra*.) And, while it is opposed by New Jersey's electric power utilities, they have failed to bring forth reasons to support their opposition, other than the simple truism that each cogenerator is different.

The standard offer contract is a uniform contract with the essential terms already filled in and approved by the State. (Logically, a variety of standard offers may be approved by the State, depending on such variables as whether the cogenerator will use renewable fuels or burn solid waste, the size of the cogenerator, and other factors.) The contract empowers the cogenerator to sign the contract "as is" or negotiate any condition it wishes. But the utility cannot refuse the contract as signed. Once the cogenerator has signed it, the contract is an enforceable legal instrument (*Id.*) In this way, bargaining positions are more nearly equalized, and if negotiations flag, the cogenerator always has the option of fixing his signature to the bottom of the page.

The outline of such a contract at a minimum should include the following:

Part I. Business Relationship to the Utility

- A. Status with FERC as a qualifying facility.
- B. Purchase price for power and method of payment to the non-utility producer.
- C. Price for back-up power and method of payment to the utility.
- D. Cost of interconnection and method of payment.
- E. Liability.
- F. Liability insurance.
- G. Access to producer's facilities.
- H. Conditions for interruption of
 - 1. power to the facility, or
 - 2. power from the facility.
- I. Notice requirements for interruption.
- J. Penalty clause for nonperformance of a provision in the contract.
- K. Dispute resolution and arbitration.

Part II. Technical Relationship with the Utility (including safety features)

A. Conformance to applicable laws, codes, regulations and ordinances.

B. Technical requirements for

1. interconnection and
2. operation.

The most important single element in this contract is the price for power: How much can the potential investors expect in the revenue stream from this facility? Since New Jersey will adopt a statewide proxy unit method of calculating buy-back rates, together with a pioneer rate for energy, this will be filled in at the conclusion of that process of determination. Alternatively, for those eager to proceed in the interim, the locked-in projection of the PJM billing rate—together with a premium for the environmental and social benefits of cogeneration—may also serve as one contract rate. (The Legislature could even establish a "floor rate" as it did in New York; this rate would then be the minimum for the benefit of a cogenerator.)

Access to Natural Gas

Cogeneration facilities can use almost any combustible matter as their fuel. Some units burn almond shells, corn husks, sawdust, and other forms of waste, including municipal solid waste (resource recovery). Others are not cogenerators at all, but are wind-powered forms of small-power production. Still others will use coal. Most, however, rely on the cleanest burning fuel possible, natural gas. With the end of the gas crisis of the 1970s, natural gas is in abundant supply; but a combination of factors has made it difficult for this gas glut to translate into low prices for all users, including cogenerators. Yet gas is clearly the best fuel, particularly because of air quality standards in New Jersey. As a result, no cogeneration policy is comprehensive without making provision for access to natural gas.

Until very recently, many industries were turning to direct purchases of gas from producers far from New Jersey as one way to beat the high cost of gas delivered by Local Distribution Companies (LDC's or gas utilities). However, a court order in *Maryland Peoples' Counsel v. FERC*, 761 F. 2d 768 (D.C. Cir. 1985), and 761 F. 2d 780, and the rising tide of competition in gas transportation services have led FERC radically to alter the rules of gas transportation in Order No. 436.

Interstate pipelines historically purchased gas from the well-head producers, then sold it in bulk to the

LDC's which re-sold it retail to the public. The new FERC policy gives pipelines a fundamental choice: Either they can transport all gas on a nondiscriminatory policy or they may not transport at all. They no longer may transport gas to some customers and not for others or charge what FERC labels as discriminatory or preferential rates. (They can of course, continue to transport and sell their own gas.) While a policy against discrimination appears basic to fairness, it may not lead to the result sought by FERC—more competition in the interstate natural gas market. When the pipelines are glutted with their own high-priced gas which they cannot sell, they are naturally reluctant to transport cheaper gas through their pipelines to cogenerators buying gas from others.

As this transition to the new FERC rules evolves, cogenerators have three choices on fuels: First, they can choose to use non-traditional fuels, such as solid waste or even coal. Second, they can choose to burn natural gas. Or, third, they can choose to burn oil.

The first is highly desirable, where it can be accomplished safely and without harm to the environment. Indeed, it is State policy to encourage or compel counties to plan for the ultimate disposition of municipal solid waste in resource recovery facilities that will generate electricity (*N.J.S.A. 13:1E-6(b)(1)* and 1E-93, and 48:13A-1, *et seq.*). See also, Part One, Chapter 3 of this Master Plan. However, siting waste-to-energy plants will prove difficult and controversial, as with landfills.

If a firm can burn low-sulphur coal or coal in a fluidized bed or otherwise comply with air quality standards, it should be encouraged to do so. Coal, however, has not yet proven itself as an attractive fuel for urban cogeneration projects, especially smaller ones.

This leaves natural gas or oil for most users. The former is clean to burn, which makes it highly desirable in urban settings where so many cogeneration projects can be expected. The latter is not nearly so clean and comes primarily from foreign imports. But at least there are oil dealers from which to choose.

The DOE believes that natural gas is by far the preferred choice. Without transportation gas, utilities must provide gas to these users on a reliable and affordable basis. (If not, some companies may be forced to construct their own connections to interstate pipelines, by-passing the LDC entirely.) Many gas utilities seem eager to provide all the gas they can. They recognize that gas for cogeneration will be an excellent load leveler: It will help to balance the gas company's (winter) heating-peak season with the electric utility's (summer) cooling-peak season. By selling large quantities of gas in the summer to a cogenerator, which in

turn sells power to a utility straining to meet peak demands, both utilities appear to benefit along with the cogenerator.

Environmental Permit Procedures

Siting cogeneration units in a densely populated, heavily industrialized state can be difficult. The DEP routinely requires a variety of permits for any industrial, fuel-burning installation. Cogeneration is no exception. Of special concern to the industry is how long it takes to receive permit approval. (Tr. statements of R. Toppe, at 146; B. Trobaugh at 196, P. Maistro at 211, and H. Kociencki at 220, September 20, 1985.) In addition, investors worry that costly selective catalytic converters will be required on all new installation, should California's Air Resources Board adopt such a rule and other states, including New Jersey, follow suit.

The DOE believes that the DEP should recognize the positive environmental externalities conferred by cogeneration, including reducing acid pollution from western coal plants. The latter is the cause of almost all the acid rain that now harms so much of the country, especially the East Coast (J.S. Cannon, *Acid Rain and Energy: A Challenge for New Jersey* [Inform, Inc., 1984], at 2.). Acid rain, in particular, is produced by large coal-burning power plants that supply New Jersey with much of its energy.

Therefore, the DOE calls upon the DEP to establish a rapid, one-stop permitting process for cogenerators that will lessen out-of-state energy dependence. The environmental agency should be vigorous in seeking out ways to offset the pollution generated at the facility (pollution offsets). Giving the facilities explicit credit for their contribution to New Jersey's acid rain efforts is clearly justified.

Cogeneration in a Power-Gluttled Market

California has led the nation in promoting a successful cogeneration industry. In less than five years installed cogeneration capacity has jumped from 300 MW to about 2,000 MW with still more under negotiation (*The 1985 California Electricity Report, supra.*) The California Energy Commission and the PUC are now facing the problem which the utilities had told them could

never happen: too much cogeneration capacity.

Some commentators fear that a cogeneration glut could lead to a death spiral in electric utilities. As more customers generate their own power and sell back to the utility, which is obligated to buy, fewer customers will be left to pay the fixed costs of the utility. The utility will then raise rates to the remaining customers, which will lead to still more customers leaving the system, cogenerating their own power, or simply increasing their conservation. This concern is especially troubling for utilities which are just finishing costly nuclear power plants. Such utilities may call for caps to be placed on new cogeneration capacity. Alternatively, they may do all in their power to discourage cogeneration through whatever legal means are at their disposal.

Restricting the amount of new capacity from these other sources is at best a short-term solution that would impose substantial hidden costs on the public. The public will pay more than it should if potential cogenerators are denied the opportunity to supply the public with lower cost energy. Setting a limit on cogeneration is roughly akin to tariffs, import quotas and other trade restrictions that may protect certain interests but only by transferring hidden costs to the public. At the same time, the existing utility network must be maintained. Accordingly, some method must be found for encouraging constant innovation and competition but without undermining the basic infrastructure in electricity that is the hallmark of the utility industry.

The DOE believes that there are several approaches to this problem. No utility power plants should be exempt from the competitive forces of non-utility power. Nor should non-utility sources be shielded against the winnowing effects of market forces. The best solution is one which follows the least-cost principle of promoting economic dispatch of power sources, whether they are owned and operated by utilities or by non-utilities.

Placing all power generators on a level playing field is the logical next step in the revolution in electric power regulation and development unleashed by PURPA. There is no need to place an arbitrary lid on new power if each new increment survives a rigorous test of the marketplace. Simply put, there is no glut of power; adding more capacity means lowering production costs, reducing consumer bills, or reducing the pollution caused by single-purpose power plants. This new, decidedly more open system would resemble the growth era of the 1950s and 60s when each new utility project capitalized on economies of scale and reduced cost and rate to all. The major difference here is that the test of need for new capacity would be based upon market forces. Also, much of the new capacity would be non-utility units that displace utility units; just as new utility ca

capacity in those years often drove non-utility sources out of operation.

In such a competitive setting, if "new" power sources replace the "old" sources, the latter could then be written off (perhaps mothballed, placed under new management, or sold off). If found to be obsolete, the uneconomic units would no longer be "used and useful" to consumers. Therefore, they would not be charged to ratepayers. This approach avoids the "Catch-22" that competition will lead to higher rates even when the competitors will supply electricity at lower rates, because utilities may charge ratepayers for economically obsolete capacity. If a facility—whether it is a cogenerator or a utility unit—cannot compete, then the State must not tolerate its forced subsidization by the public. Such a process might be characterized as one which focuses on the fully avoidable cost to the consumer, not to the utility, although in the long-run the result should be the same.

Change and innovation would substitute for the static concept that utility facilities, once approved, stay in the rate base until they are too old to operate or until they are replaced by new utility units. With *de facto* and *de jure* competition ushered in by cogeneration and other non-utility power sources, the power supply industry might resemble the automobile retail market: new vehicles replace existing cars even if they retain some useful life (as evidenced by the used car trade), not because the current stock of cars is determined by some authority to be inadequate in number or seating capacity, but because the new entries offer consumers a choice of lower cost, more reliability, greater safety, or other perceived attractions. Regulation, in an atmosphere of competition, will have to adjust to facilitate a healthy mix of embedded utility capacity, notably in the transmission and distribution area, and emerging non-utility sources that can bid against each other to serve consumers in the lowest cost, most efficient and environmentally sound manner. In this light, there can never be a glut of ways to improve service, improve air quality, and reduce consumers' bills.

New Jersey does not have to begin today to confront a saturated market for non-utility power sources, but the time for doing so could come even faster than in California, which has served the nation so well as a kind of energy laboratory. As a result, the BPU and the DOE, aided by the active participation of the emerging cogeneration industry and the existing utilities, must begin immediately to prepare for a regulatory regime which accurately mirrors the competitive forces now gathering. Therefore, no lid needs to be considered at this time and no moratorium on new cogeneration appears justifiable in the future, if we proceed to plan and prepare for a smooth transition to market-based energy policies in this vital area.

Miscellaneous Concerns

The duty to negotiate in good faith: While the provision of standard offer contracts and firm buy-back rates will do much to promote good faith bargaining by utilities, more protection may still be in order. Utilities may devise tactics or demands which discourage cogeneration. For example, JCP&L's demand that cogenerators sign a recapture clause would deny a cogeneration investor the current use of contracted for payments. (See Statement of Scott Spiewak at Tr. 55-56, September 20.) As such, it can only be described as a bad faith negotiating position. Other bad faith demands can be expected to be identified. To prevent these from holding up the contract process, the BPU and the DOE must maintain an open door policy for resolution of contract disputes. In particular, the BPU should have an expedited appeal process available to all cogenerators. This process would entitle any aggrieved party to petition the BPU for expedited disposition of a contract claim or an argument that a bargaining position is in bad faith. A list of such bad faith demands should be maintained and updated. Whenever a utility has been found to have negotiated in such a manner, penalties should be imposed on the utility and rewards allocated to the cogenerator which brought them to the attention of the BPU.

Maintaining Data on Cogeneration Development: Every cogenerator should file a registration statement with the DOE and the BPU simultaneous with its request for contract negotiations with a utility. The registration statement will require that the applicant identify the fuels to be used, and the size of the facility, as well as provide other relevant and potentially helpful information. With this process, it will be possible to monitor negotiations, review the milestones in each project, and determine whether any facility should lose its place in line for failure to proceed, while pushing other projects forward. A final registry of facilities will also help energy planners account for the full impact of cogeneration in the State, as it progresses from project inception to on-line facilities.

Utility Entry Into Cogeneration Marketing: With the growth in cogeneration, it is understandable that electric utilities should become interested in this source of power production. The risks to permitting such diversification are obvious. Utility-owned subsidiaries might receive more favorable treatment from their parent utilities, such as higher buy-back rates, easier negotiating, better credit and billing terms, and more favorable cancellation provisions. These fears have been realized in some states. In California, for example, San Diego Gas & Electric has been charged with agreeing to an energy-pricing formula for its subsidiary which exceeds the avoided cost offered to other cogenerators.

Cogen. Rept., November 3, 1985, p. 5). Clear conflicts of interest have been found where Southern California Edison personnel hold important positions in its wholly-owned cogeneration-subsidary (*Id.*)

PURPA limits utility ownership in any qualifying facility to less than 50 percent of the equity in the project (18 C.F.R. 206). By implication, a utility, therefore, may invest up to that amount and still qualify as a cogenerator entitled to all the guarantees of a non-utility cogenerator. This policy creates incentives for utility management to favor their own subsidiaries, however arms-length the transactions might appear.

On the other hand, if utility shareholders can enjoy some of the benefits of a healthy cogeneration industry, their management will be more receptive to the concept in general and to specific projects in particular. Also, utility investment capital, customer relations and engineering abilities can be helpful in promoting the growth of this vital industry.

The Department believes that the State should offer conditional encouragement to the trend of utilities entering the cogeneration market. (PSE&G and JCP&L have already established such subsidiaries which are actively signing up projects.) Mindful of the risk of anti-competitive actions, however, the State must impose a higher level of scrutiny and special safeguards to all utility-subsidary projects, at least until the independent cogeneration industry in the State has grown sufficiently to compete equally with utility-owned units. Thus, all contracts for large increments of cogeneration from utility-subsidaries should be subject to a period of review by the BPU. Similarly, a policy of notice and protest should be offered in all such contracts, such that independents can protest to the BPU if they believe that they were squeezed out of a bid or were otherwise unfairly disadvantaged in efforts to sign up a customer. Should no problems develop in New Jersey over a reasonable period, then such procedures might be discontinued. But at least in the early going, New Jersey must profit from the experience in other states and take steps to see that this nascent industry is given the chance to flourish, while permitting proper opportunities for utilities to advance in this worthwhile direction.

Setting Cogeneration Quotas or Goals: One way to promote utility use of cogenerated power is to set quotas. Failure to achieve these goals could lead to penalties. The California PUC imposed a 1/7 of 1 percent penalty at the conclusion of its OII-26 investigation on the rate of return of PG&E for its failure to promote alternative energy contracts. The utility's response was dramatic with PG&E soon emerging as a national leader in the promotion of alternative and small-power energy sources (G. Maneatis, "The Nation's Leading Alternative Energy Utility, PG&E," 114 *Pub. Util. Fort.*, No. 12, Dec. 20, 1984, 18-22. For a history of this seminal case see D. Roe, *Dynamos and Virgins*, Random House, 1985). New Jersey may need to have the option of imposing penalties for utility failure to promote cogeneration to bargain in good faith, or otherwise to develop its potential.

Incentives for small-power production: Many small cogeneration projects, namely units of 100 kilowatts or less, find it difficult to obtain needed financing due to the marginal economics of all small facilities. These include: capital costs which are high relative to labor, interconnection costs, fuel costs, and stand-by charges. Yet these small units offer great benefits to users and, in the aggregate, to society through their contribution to system reliability and economic development. They are most apt to be used by financially strapped customers, such as non-profit hospitals, YMCA's, schools, and other small to medium-size institutions. By reducing their costs of energy, small power production can enable them to provide greater services at lower costs to their clients and the community.

Accordingly, in order to facilitate their widespread use, the Department believes that units with a capacity of 100 kw or less should have the option of running their load meter backwards, rather than require them to sell their excess output to the utility. Any electricity sold to a utility would first be offset by a credit for purchases from the utility in a simultaneous "buy-sell" transaction, at the customer's request. All net energy sold to the utility would be billed at the retail rate applicable to the user.

SUMMARY AND RECOMMENDATIONS

ISSUES AND PROBLEMS

ACTIONS AND STRATEGIES

1. A STANDARD METHOD OF CALCULATING FAIR UTILITY BUY-BACK RATES IS NEEDED TO ENCOURAGE THE DEVELOPMENT OF COGENERATION.

[The rates offered by electric utilities for the purchase of cogenerated electricity are too low, too variable, and too unpredictable. In addition, these rates fail to satisfy the PURPA requirement to offer rates based upon the "full avoided cost" of cogeneration as a substitute for utility-owned and -operated power plants.]

THE BPU SHALL COMMENCE A PROCEEDING TO ESTABLISH RATES FOR COGENERATION BUY-BACK. THIS PROCEEDING SHALL BEGIN NOT LATER THAN 90 DAYS AFTER THE ADOPTION OF THIS PLAN AND SHALL CONCLUDE AS EXPEDITIOUSLY AS POSSIBLE. BUT IN NO CASE SHALL THE PROCEEDING LAST MORE THAN SIX MONTHS BEFORE A FINAL ORDER IS ISSUED. PROGRESS REPORTS SHALL BE PREPARED AND MADE PUBLIC EVERY 30 DAYS TO DETAIL ALL CRITICAL PATHS AND PROGRESS, ANY IMPEDIMENTS TO MAINTAINING THE HEARING SCHEDULE, AND SUCH OTHER INFORMATION AS THE DOE MAY REQUEST.

THIS PROCEEDING SHALL DETERMINE ALL ISSUES RELATING TO THE APPROPRIATE BUY-BACK RATE. FOR THE CAPACITY COMPONENT OF THE RATE, THE BPU WILL USE THE PROXY UNIT METHOD OF ANALYSIS, ASSUMING THE NEED FOR A NEW BASELOAD COAL-FIRED POWER PLANT, AS DESCRIBED HEREIN, BY 1992. FOR THE ENERGY COMPONENT, THE BPU SHALL DETERMINE THE RATE BASED UPON THE CURRENT RATE FOR OIL- OR GAS-GENERATED ELECTRICITY AT A BASELOAD FACILITY. THIS RATE SHALL APPLY FOR THE PERIOD OF 1986-1992. AT WHICH TIME THE PROXY UNIT'S FUEL COST WILL BE THE ENERGY COMPONENT INSTEAD.

THE BPU SHALL MAKE AVAILABLE FOR COGENERATORS RATES BASED UPON LONG-TERM LEVELIZED PJM COST PROJECTIONS.

THE ELECTRIC UTILITIES SHALL FILE WITH THE DOE AND MAKE PUBLIC THEIR ESTIMATES OF PROJECTED PJM PURCHASE POWER RATES FOR THE NEXT 5-, 10- AND 15-YEAR PERIODS. A COGENERATOR SHALL HAVE THE OPTION OF SIGNING A CONTRACT WITH A UTILITY USING THESE ESTIMATES. HOWEVER, A COGENERATOR OR ANY OTHER PERSON MAY OBJECT TO THE ESTIMATES. THE BPU SHALL THEN COMMENCE A HEARING, WHICH SHALL BEGIN AND CONCLUDE AS EXPEDITIOUSLY AS POSSIBLE, BUT IN NO CASE SHALL LAST LONGER THAN 30 DAYS.

2. BACK-UP POWER RATES AND LACK OF ACCESS TO BACK-UP POWER DISCOURAGE INVESTMENT IN OTHERWISE FEASIBLE COGENERATION SYSTEMS.

[A 1981 BPU order allows the utilities to base their charges upon an assumed system outage rate of 15 percent, while experience indicates that the outage rate is closer to 5 percent. Gaining access to the utility system often involves problems such as long delays, lack of cooperation, unreasonable demands, and high costs to interconnect. In addition, a FERC decision has raised much doubt as to whether third-party cogenerators will have access to back-up power at any price.]

UPON REQUEST OF A COGENERATOR, EACH ELECTRIC UTILITY SHALL PROVIDE ALL NECESSARY FORMS OF BACK-UP POWER, INCLUDING BUT NOT LIMITED TO SUPPLEMENTARY POWER, BACK-UP POWER, MAINTENANCE POWER, AND INTERRUPTIBLE POWER. NO UTILITY MAY LIMIT THE OFFER OF OR ACCESS TO BACK-UP POWER TO ANY COGENERATOR OR ITS CUSTOMERS ON THE BASIS OF OWNERSHIP INTEREST OR FINANCING BASIS OF THE COGENERATION UNIT.

EACH UTILITY SHALL PUBLISH A GENERIC LIST OF COMPONENTS FOR INTERCONNECTION, WHICH SHALL APPLY IN ALL CASES EXCEPT WHERE THE APPLICANT PRESENTS A CLEARLY DISTINCT PROPOSAL THAT MERITS INDIVIDUALIZED ATTENTION AND NEGOTIATION. THIS LIST SHALL BE SUBMITTED TO THE BPU WITHIN 30 DAYS OF THE ADOPTION OF THIS MASTER PLAN AND, UNLESS OBJECTED TO, SHALL CONSTITUTE THE STEPS REQUIRED FOR SUCCESSFUL INTERCONNECTION. IF OBJECTED TO, THE BPU SHALL PROMPTLY SCHEDULE AND COMPLETE A HEARING AND ISSUE A DETERMINATION NO LATER THAN 30 DAYS AFTER THE CONCLUSION OF THE HEARING. IF ANY UTILITY UNREASONABLY DELAYS OR OBSTRUCTS A COGENERATOR IN ITS EFFORTS TO OBTAIN INTERCONNECTION, THE BPU SHALL IMPOSE FINANCIAL PENALTIES TO BE AWARDED IN PART TO THE COGENERATOR BRINGING THE COMPLAINT.

THE RATES FOR SALES OF BACK-UP POWER SHALL NOT BE BASED UPON THE ASSUMPTION THAT FORCED OUTAGES OR OTHER REDUCTIONS IN ELECTRIC OUTPUT BY ALL COGENERATION FACILITIES ON AN ELECTRIC UTILITY'S SYSTEM WILL OCCUR SIMULTANEOUSLY, OR DURING THE SYSTEM PEAK, OR BOTH; AND SHALL TAKE INTO ACCOUNT THE EXTENT TO WHICH SCHEDULED OUTAGES OF THE COGENERATION FACILITIES CAN BE USEFULLY COORDINATED WITH SCHEDULED OUTAGES OF THE UTILITY'S FACILITIES. THE BPU SHALL REQUIRE UTILITIES TO SUBMIT STANDARD BACK-UP POWER RATES AS PART OF THE REQUIREMENT TO SUBMIT AND MAINTAIN STANDARD OFFER CONTRACTS.

EACH COGENERATION FACILITY SHALL BE OBLIGATED TO PAY ANY REASONABLE INTERCONNECTION COSTS WHICH THE BPU AUTHORIZES THE UTILITY TO CHARGE. NO RATE MAY EXCEED THE ACTUAL AND REASONABLE COST OF COMPLETING THE INTERCONNECTION, UNLESS A RETURN ON SAME IS AUTHORIZED BY THE BPU ON SIMILAR INTERCONNECTIONS FOR NON-COGENERATING CUSTOMERS. NO INTERCONNECTION FEE SHALL BE REQUIRED TO BE PAID IN ADVANCE. EACH COGENERATION FACILITY SHALL HAVE THE OPTION OF PAYING ITS INTERCONNECTION COSTS AS PART OF ITS REGULAR BILLING OR AS A DEDUCTION FROM BUY-BACK RATES. STANDARD BUY-BACK RATES AND TERMS SHALL BE INCLUDED IN EACH STANDARD OFFER CONTRACT.

3. COGENERATORS MUST HAVE ACCESS TO TRANSMISSION LINES TO WHEEL EXCESS ELECTRICITY AT REASONABLE RATES.

[Electric utilities maintain barriers, including unpredictable wheeling rates and non-economic restraints, to non-utility power sources who wish to gain access to transmission lines for the sale of cogenerated power to utilities in different service territories. In addition, cogenerators serving more than one facility need to engage in self-wheeling to take full advantage of economies of scale.]

IF A COGENERATION FACILITY AGREES, AN ELECTRIC UTILITY SERVING THE AREA WHEREIN THE FACILITY IS LOCATED SHALL TRANSMIT THE ENERGY OR CAPACITY OR BOTH TO ANY OTHER ELECTRIC UTILITY. IF THE UTILITY FAILS TO DO SO, UPON REQUEST THE UTILITY SHALL BE OBLIGATED TO PURCHASE THE POWER FOR USE IN ITS OWN SYSTEM AND SHALL PAY THE COGENERATION FACILITY AS IF IT HAD PERFORMED AS REQUESTED, UNLESS THE UTILITY SHOWS GOOD CAUSE FOR ITS REFUSAL TO WHEEL. GOOD CAUSE SHALL MEAN THE PHYSICAL OR ENGINEERING INABILITY TO TRANSMIT THE POWER DUE TO LACK OF TRANSMISSION CAPACITY, NOT INCLUDING A LACK OF CAPACITY CAUSED BY THE RESERVATION OF CAPACITY FOR UTILITY-GENERATED POWER NOT ON THE SYSTEM, TRANSMISSION OF POWER FROM OTHER UTILITIES OR WHEN A LACK OF CAPACITY SHOULD HAVE BEEN FORESEEN BY THE UTILITY DUE TO GROWTH ON THE SYSTEM.

WHERE UTILITY TRANSMISSION CAPACITY HAS BEEN FOUND BY THE BPU TO BE SATURATED, THE BPU SHALL ORDER THE UTILITY TO DEVELOP PLANS FOR THE EXPANSION OF CAPACITY IN THE MOST ENVIRONMENTALLY SOUND AND FISCALLY PRUDENT MANNER, BUT THE UTILITY SHALL NOT CHARGE COGENERATION FACILITIES MORE THAN THEIR FAIR SHARE OF NEW CAPACITY ON THE BASIS OF AN AUCTION AND BID SYSTEM IN WHICH UTILITY-SUPPLIED POWER SHALL HAVE NO ADVANTAGE OR PREFERENCE OVER POWER TO BE GENERATED BY A COGENERATION FACILITY.

ANY UTILITY TO WHICH SUCH ENERGY OR CAPACITY IS TRANSMITTED SHALL PURCHASE SAME AS IF THE COGENERATION FACILITY WERE SUPPLYING ENERGY OR CAPACITY DIRECTLY TO SUCH ELECTRIC UTILITY, EXCEPT THAT THE RATE FOR PURCHASE BY THE ELECTRIC UTILITY SHALL BE ADJUSTED UP OR DOWN TO REFLECT LINE LOSSES AND SHALL NOT INCLUDE ANY CHARGES FOR TRANSMISSION.

NO UTILITY SHALL CHARGE FOR LINE LOSSES DUE TO TRANSMISSION UNLESS THE UTILITY DEMONSTRATES THE ACTUAL INCIDENCE OF SAID LINE LOSSES ATTRIBUTED TO THE SPECIFIC COGENERATION FACILITY IN QUESTION.

NO UTILITY SHALL CHARGE FOR LINE LOSSES DUE TO TRANSMISSION IF THE COGENERATION FACILITY IS LOCATED WITHIN REASONABLE PROXIMITY OF LARGE LOAD DEMANDS ON THE UTILITY SYSTEM, DUE TO THE NEGATIVE NATURE OF SUCH LINE LOSSES.

NO UTILITY MAY CHARGE FOR LINE LOSSES UNLESS THE BPU APPROVES SAID CHARGES, AND IN NO CASE SHALL A COGENERATION FACILITY BE REQUIRED TO PAY FOR SUCH LOSSES IN ADVANCE OR WITHOUT THE OPTION TO PAY OVER A MUTUALLY AGREED PERIOD.

THE BPU SHALL ESTABLISH UNIFORM, STATEWIDE RATES FOR TRANSMISSION SERVICES WHICH SHALL BE INCLUDED IN STANDARD OFFER CONTRACTS AT THE OPTION OF THE COGENERATION FACILITY. SUCH RATES SHALL BE NON-DISCRIMINATORY AND NO GREATER THAN THE ACTUAL COST OF TRANSMISSION, TOGETHER WITH SUCH RETURN ON INVESTMENT AS THE BPU AUTHORIZES.

UPON REQUEST, EACH COGENERATION FACILITY SHALL BE ENTITLED TO TRANSMIT ITS POWER GENERATION OR ANY PORTION THEREOF TO AND AMONG ITS CUSTOMERS ON A NON-DISCRIMINATORY BASIS AT A RATE TO BE DETERMINED BY THE BPU.

4. THE USE OF STANDARD OFFER CONTRACTS CAN HELP TO EQUALIZE THE BARGAINING POWER OF UTILITIES AND COGENERATORS.

[Many factors contribute to the unfair bargaining advantages of utilities over cogenerators, including the monopsony position of the utility and the greater risk exposure of cogeneration investors. Steps must be taken to prevent utilities from taking advantage of their monopsony status.]

THE BPU SHALL REQUIRE EACH ELECTRIC UTILITY TO PREPARE STANDARD OFFER CONTRACTS WITHIN 30 DAYS OF THE ADOPTION OF THIS MASTER PLAN. EACH CONTRACT SHALL ADDRESS AT A MINIMUM ALL THE REQUIREMENTS PRESENTED IN THIS PLAN AS SUITABLE FOR CONTRACT OFFERS AND SUCH OTHER REQUIREMENTS AS THE BPU OR THE DOE SHALL, FROM TIME TO TIME, REQUIRE TO BE INCLUDED.

A STANDARD OFFER CONTRACT IS AN OFFER TO ENTER INTO A CONTRACT WITH ANY QUALIFIED COGENERATION FACILITY. IT SHALL INCLUDE ALL ESSENTIAL TERMS REQUIRED OF THE UTILITY AND THE COGENERATION FACILITY AND ENTITLES THE FACILITY TO ACCEPT THE TERMS OF THE CONTRACT ON ITS FACE OR TO NEGOTIATE ANY CHANGES, ADDITIONS, OR DELETIONS IT WISHES. UPON SIGNING THE CONTRACT AND FILING A CERTIFIED COPY WITH THE UTILITY, THE BPU AND THE DOE, THE CONTRACT SHALL BE BINDING ON THE SIGNATORY AND THE UTILITY.

ANY COGENERATION FACILITY SHALL BE ENTITLED TO ACCEPT THE STANDARD OFFER CONTRACT PRESENTED TO THE BPU OR IT MAY PROTEST THE TERMS, CONDITIONS OR ANY LANGUAGE IN THE CONTRACT OFFER AND REQUEST A HEARING WITH THE BPU, WHICH THE BPU SHALL COMMENCE AND COMPLETE AS SOON AS POSSIBLE, NOT TO EXCEED SIX MONTHS. AT THE CONCLUSION OF THIS HEARING, THE BPU SHALL REQUIRE WHATEVER CHANGES, ADDITIONS OR DELETIONS NECESSARY TO ACHIEVE THE PURPOSES OF THIS MASTER PLAN. THE STANDARD OFFER AS APPROVED OR MODIFIED SHALL THEN OPERATE AS A BINDING LEGAL INSTRUMENT IN THE SAME MANNER AS A STANDARD OFFER CONTRACT SUBMITTED BY THE UTILITY AND SUBJECT TO ACCEPTANCE BY A QUALIFIED COGENERATION FACILITY.

5. COGENERATORS NEED ACCESS TO ADEQUATE, AFFORDABLE SUPPLIES OF NATURAL GAS

[Natural gas is the principal fuel of cogeneration and, due to its clean-burning properties, the fuel of choice in urban and densely populated areas. Prospective cogenerators often have difficulty in securing supplies at affordable prices.]

THE BPU SHALL REQUIRE EACH NATURAL GAS UTILITY (LOCAL DISTRIBUTION COMPANY OR LDC) TO OFFER TO PROVIDE NATURAL GAS TO ANY COGENERATION FACILITY AS THE PRIMARY FUEL FOR THE FACILITY IN SUCH QUANTITIES AND QUALITY NECESSARY FOR SUCCESSFUL COGENERATION. WITHIN 30 DAYS OF THE ADOPTION OF THIS PLAN, EACH LDC SHALL ALSO PREPARE AND SUBMIT PLANS TO THE BPU AND THE DOE WHICH SHALL DETAIL THE AMOUNTS, QUALITY AND RATES TO BE CHARGED FOR NATURAL GAS FOR COGENERATION, ANY SERVICE EXTENSIONS NECESSARY, AND ANY RESTRICTION OR CONDITIONS ON THE RECEIPT OF SUCH SERVICES.

RATES FOR TARIFFS FOR NATURAL GAS FOR COGENERATION SHALL BE NO HIGHER THAN THOSE FOR NATURAL GAS SOLD BY THE LDC TO SIMILARLY SITUATED CUSTOMERS, EXCEPT THAT SOME CREDIT SHOULD BE ACCORDED COGENERATORS IN LIGHT OF THE EXTERNAL BENEFITS CONFERRED BY COGENERATION.

6. IN ORDER TO ENCOURAGE COGENERATION, THE PROCESS OF OBTAINING ENVIRONMENTAL PERMITS MUST BE EXPEDITED.

[Cogeneration developers have had difficulty in gaining the necessary environmental permits from the Department of Environmental Protection. They also fear the exaction of unreasonable air pollution requirements that may make cogeneration uneconomic.]

THE DEP SHALL ESTABLISH A PROCEDURE FOR THE PROMPT AND FAIR RESOLUTION OF ALL PERMIT REQUIREMENTS FOR COGENERATION APPLICANTS WITHIN A SINGLE OR INTEGRATED PERMIT PROCESS.

DUE TO THE POTENTIAL NET REDUCTIONS IN VARIOUS AIR POLLUTANTS IN NEW JERSEY FROM THE WIDESPREAD USE OF COGENERATION TO SUBSTITUTE FOR UTILITY POWER GENERATION AND PURCHASES, THE DEP SHALL DEVISE AN OFFSETS STRATEGY WHEREBY POLLUTANTS EMITTED AT THE LOCAL LEVEL FROM A COGENERATION FACILITY MAY BE OFFSET FROM NET REDUCTIONS IN POLLUTANTS ENTERING THE SAME GENERAL AREA.

THE DEP SHALL DEVISE AND EMPLOY METHODS FOR DETERMINING THE AGGREGATE AIR QUALITY IMPACTS OF VARIOUS LEVELS AND TYPES OF COGENERATION USAGE AS AN ALTERNATIVE OR SUPPLEMENT, IN WHOLE OR IN PART, TO REQUIRING INDIVIDUALIZED AIR QUALITY REVIEWS FOR EACH COGENERATION APPLICANT.

7. THE GROWTH OF COGENERATION MAY BE STIFLED BY THE CONTINUING AND, IN SOME CASES, GROWING GLUT OF UNECONOMIC BUT UTILITY-OWNED ELECTRIC POWER GENERATING CAPACITY.

[As more customers generate their own power and sell back to the utility, fewer customers will be left to pay the fixed costs of the utility. The utility will then raise rates to remaining customers, leading to still more customers leaving the system, cogenerating their own power, or simply increasing conservation. Restricting the amount of new capacity from other sources is at best a short-term solution that would impose substantial hidden costs on the public.]

EACH COGENERATION SPONSOR SHALL FILE WITH THE DOE A CONFORMING COPY OF ITS APPLICATION TO BE CERTIFIED AS A QUALIFYING FACILITY PURSUANT TO FERC REGULATIONS 18 C.F.R. 292.203 AND .207, AT THE SAME TIME THAT IT FILES FOR SAME WITH FERC. THE DOE SHALL THEN MAINTAIN AN OPEN REGISTER OF "QF" APPLICATIONS AND ALL UPDATES AS

PROVIDED BELOW. EACH COGENERATOR SHALL THEN FILE WITH THE DOE AT LEAST ONCE EVERY SIX MONTHS, OR MORE OFTEN IF SO ORDERED, A REPORT SETTING FORTH THE FOLLOWING:

- A. A LIST OF CRITICAL MILESTONES IN THE DEVELOPMENT OF THE COGENERATION PROJECT, ESTIMATED DATES FOR ACHIEVING THOSE CRITICAL POINTS AND ANY IMPEDIMENTS AND PLANS FOR MEETING SAME;
- B. THE STATUS OF THE COGENERATION PROJECT IN MEETING THE MILESTONES IDENTIFIED IN ITS PRIOR REPORT OR AS THEY MAY BECOME KNOWN;
- C. THE STATUS OF THE PROJECT WITH THE DEP AND ANY OTHER FEDERAL, STATE OR LOCAL AGENCY WHICH REQUIRES PERMITS TO CONSTRUCT OR OPERATE THE FACILITY;
- D. THE STATUS OF THE COGENERATION PROJECT IN ITS CONTRACT DEALING WITH ANY ELECTRIC UTILITY REGARDING BUY-BACK RATES, INTERCONNECTION, BACK-UP POWER, WHEELING, NATURAL GAS, OR ANY OTHER RELEVANT NEGOTIATION ISSUE INVOLVING REGULATED UTILITIES IN NEW JERSEY;
- E. A CONFORMING COPY OF THE CONTRACT(S) WITH THE ELECTRIC UTILITY(IES) AT THE TIME IT IS SIGNED AND FINALIZED;
- F. A NOTARIZED STATEMENT FROM THE PROJECT SPONSOR WITHIN 24 HOURS OF THE DATE THAT (1) CONSTRUCTION HAS BEGUN ON THE FACILITY, (2) WHEN CONSTRUCTION HAS BEEN COMPLETED, AND (3) WHEN THE FACILITY HAS BEEN BROUGHT INTO OPERATION;
- G. A REPORT OF THE FACILITY'S OPERATING RECORD AT THE CONCLUSION OF EACH CALENDAR YEAR, NOTING ANY CHANGES IN HEAT RATE, FUEL USE, SIZE, EFFICIENCY, OUTAGES, OR OTHER RELEVANT INFORMATION.

AT LEAST ANNUALLY THE DOE SHALL PUBLISH A STATUS REPORT ON COGENERATION IN NEW JERSEY WHICH SHALL INCLUDE, BUT NEED NOT BE LIMITED TO, A SUMMARY OF THE PRIOR DATA AND SHALL PROMINENTLY SET FORTH A STATEMENT AS TO THE AMOUNTS OF COGENERATION PLANNED, CERTIFIED WITH FERC, UNDER CONTRACT, UNDER CONSTRUCTION, AND IN OPERATION.

ANY COGENERATION PROJECT OF 100 MW OR LARGER SHALL BE DESIGNATED AND CONSIDERED TO BE AN "ENERGY FACILITY" PURSUANT TO THE DEPARTMENT OF ENERGY ACT, N.J.S.A. 52:27F-15(c), AND THEREFORE SHALL REQUIRE A FINDING OF NEED AND CONFORMANCE WITH THE APPROVED ENERGY FORECAST AND RESOURCE PLAN OF THE AFFECTED UTILITY(IES), PURSUANT TO THE REQUIREMENTS OF N.J.A.C. 14A:20-1.1, *ET SEQ.*, AND THE ENERGY FACILITY REVIEW POLICIES OF THE DEPARTMENT.

WITHIN SIX MONTHS OF THE ADOPTION OF THIS MASTER PLAN, EACH ELECTRIC POWER UTILITY SHALL SUBMIT A PLAN TO THE DOE AND TO THE BPU FOR ACHIEVING A REALISTIC MARKET FOR POWER COMPETITION BETWEEN AND AMONG UTILITY FACILITIES AND NON-UTILITY FACILITIES, INCLUDING METHODS FOR COMPARING THE DIRECT AND INDIRECT COSTS OF POWER GENERATION, SYSTEM EFFICIENCY AND RELIABILITY AND ENVIRONMENTAL IMPACTS. THE PLAN WILL DESCRIBE METHODS FOR AUCTIONING RIGHTS TO SELL POWER TO THE UTILITY ON A NON-DISCRIMINATORY BASIS. UTILITY FACILITIES AND NON-UTILITY SOURCES WILL HAVE EQUAL OPPORTUNITY TO COMPETE FOR THE OPPORTUNITY TO GENERATE AND MARKET ELECTRICITY, IN ORDER TO FURTHER THE GOALS OF A LEAST-COST ENERGY STRATEGY FOR RATEPAYERS. WITHIN 30 DAYS OF RECEIPT OF THE PLANS, THE DOE AND THE BPU SHALL SET FORTH DATES FOR HEARINGS TO CONSIDER SUCH PLANS AND DETERMINE HOW BEST TO PROMOTE COMPETITION AND LEAST-COST DELIVERY OF RELIABLE, ENVIRONMENTALLY SOUND SERVICE. THESE HEARINGS SHALL BE COMPLETED WITH AN ORDER ISSUED SETTING FORTH SUCH STRUCTURE OF A MARKET FOR POWER SOURCES WITHIN ONE YEAR OF THE ADOPTION OF THIS PLAN.

8. COGENERATORS MUST BE PROTECTED FROM BAD FAITH DEMANDS AND BARGAINING

[Evidence indicates that utilities do not always bargain in good faith. While standard offer contracts and firm buy-back rates will promote good faith bargaining, more protection may be needed.]

NO UTILITY MAY REQUIRE AS A CONDITION OF ANY CONTRACT THAT THE COGENERATION FACILITY AGREE TO A RECAPTURE CLAUSE OR ANY OTHER ARRANGEMENT WHICH WILL DENY TO THE FACILITY AND ITS INVESTORS THE IMMEDIATE USE OF ALL PAYMENTS FOR THE SALE OF CAPACITY OR ENERGY.

EACH UTILITY SHALL NEGOTIATE IN GOOD FAITH AT ALL TIMES WITH ANY COGENERATION OWNER, OPERATOR OR SPONSOR AND SHALL ENDEAVOR TO REACH AN AGREEMENT IN THE SHORTEST POSSIBLE TIME.

THE BPU SHALL ESTABLISH AN ABBREVIATED PROCESS FOR THE HEARING OF COMPLAINTS, PROTESTS OR PETITIONS FOR DECLARATORY RULINGS ON BAD FAITH ACTIVITIES OR NEGOTIATING POSITIONS. UPON SUCH A FIND, THE BPU SHALL ORDER THE UTILITY TO CEASE AND DESIST FROM SUCH BAD FAITH ACTION, AND IT SHALL ORDER THE UTILITY TO PAY OR CREDIT TO THE COGENERATION PROJECT A SUM EQUAL TO ALL COSTS ATTRIBUTABLE, DIRECTLY OR INDIRECTLY, TO SUCH BAD FAITH ACTIONS.

THE BPU SHALL DEVISE, DEVELOP AND MAINTAIN A CURRENT LIST OF BAD FAITH PRACTICES, WHETHER PRESUMPTIVELY OR PER SE BAD FAITH, AND IT SHALL ENTERTAIN PETITION FOR DECLARATORY RULINGS WITH RESPECT TO ANY PRACTICE WHICH THE PETITIONER BELIEVES SHOULD BE ADDED TO OR REMOVED FROM THE LIST. SUCH PRACTICES SHALL INCLUDE, BUT NOT BE LIMITED TO, INJECTING BAD FAITH DEMANDS INTO THE NEGOTIATION PROCESS, HABITUALLY OR REPEATEDLY FAILING TO MEET REASONABLE REQUESTS FROM A POTENTIAL COGENERATOR FOR MEETINGS, ANSWERS OR DECISIONS, OR FAILING TO BRING TO MEETINGS REPRESENTATIVES KNOWLEDGEABLE ABOUT THE PARTICULARS OF THE COGENERATION PROJECT AND QUALIFIED TO RENDER DECISIONS THAT BIND THE UTILITY IN THE MANNER OF A BUSINESS AGENT. A UTILITY DEEMED TO BE ENGAGING IN SUCH BAD FAITH NEGOTIATION SHALL BE LIABLE TO THE COGENERATOR FOR ALL COSTS PROXIMATELY CAUSED BY SUCH BAD FAITH NEGOTIATION OR DEMANDS, AS DETERMINED BY THE BPU.

9. COGENERATORS MUST HAVE THE OPPORTUNITY TO PROVIDE LEAST-COST ENERGY FOR CONSUMERS.

[Cogenerators have not in the past been able to displace utility-generated capacity, even though the power generated from these sources is more expensive.]

IF A UTILITY REFUSES TO CONTRACT FOR CAPACITY OR ENERGY OR BOTH FROM AN OTHERWISE QUALIFIED COGENERATION FACILITY DUE TO A LACK OF NEED FOR THE POWER, AND IF NO OTHER PURCHASER OF THE POWER IS FOUND BY THE UTILITY WHICH WILL PURCHASE POWER TRANSMITTED TO IT, THE COGENERATION FACILITY MAY BID AGAINST POWER SUPPLIED BY UTILITY-OWNED AND -OPERATED FACILITIES OR OTHER NON-UTILITY PROJECTS. THE UTILITY SHALL SELECT THE POWER SOURCE WHICH AVOIDS THE GREATEST COST OTHERWISE INCURRED BY THE RATEPAYERS OF THE UTILITY. IF THE COGENERATOR IS AGGRIEVED BY THE DECISION OF THE UTILITY, IT MAY PETITION THE BPU FOR A DECLARATORY RULING THAT THE UTILITY SHOULD PURCHASE THE POWER OFFERED BY THE COGENERATOR UPON A FINDING THAT (1) THE POWER THAT WOULD BE DISPLACED COSTS MORE TO PRODUCE OR SUPPLY THAN THE POWER FROM THE COGENERATOR, WHETHER CAPACITY OR ENERGY OR BOTH; AND (2) THE COGENERATOR OFFERS NON-ECONOMIC BENEFITS, SUCH AS ENHANCED SYSTEM RELIABILITY, THE BURNING OF ALTERNATIVE FUELS, THE REDUCTION OF AIR OR WATER POLLUTION OR OTHER ADVANTAGES SUPERIOR TO THOSE FROM THE UTILITY FACILITY OR OTHER NON-UTILITY FACILITIES ON THE SYSTEM.

THE BPU AND THE DOE SHALL REQUIRE ELECTRIC UTILITIES TO PURCHASE FROM COGENERATORS POWER (CAPACITY OR ENERGY OR BOTH) WHICH IS LESS COSTLY TO RATEPAYERS THAN UTILITY-OWNED OR -OPERATED CAPACITY EXCESS, REGARDLESS OF WHETHER SUCH UTILITY CAPACITY IS IN RATE BASE, WHENEVER THE NON-UTILITY SOURCE WOULD CONFORM TO OR OTHERWISE PROMOTE A LEAST-COST ENERGY STRATEGY. IN MAKING THIS FINDING, THE BPU SHALL FIND THAT THE NON-UTILITY SOURCES PROMOTE A LEAST-COST ENERGY STRATEGY WHENEVER SAID COGENERATION FACILITIES OR INCREMENTS CAN DISPLACE COSTLIER UTILITY FACILITIES. THE BPU SHALL THEN PROCEED TO DETERMINE WHETHER SAID CAPACITY WHICH IS DISPLACED SHOULD BE REMOVED FROM RATE BASE AS NO LONGER USED AND USEFUL.

10. SMALL COGENERATION FACILITIES MUST BE PROTECTED FROM UNFAIR COMPETITION FROM UTILITIES THAT ENTER THE COGENERATION MARKET.

[Utilities are beginning to enter the market for cogeneration development; however, special safeguards are needed to protect competition.]

ANY COGENERATION FACILITY OF 100 KW OR LESS SHALL BE CONSIDERED A "SMALL POWER PRODUCTION FACILITY."

THE BPU SHALL REVISE ITS COGENERATION AND SMALL POWER PRODUCTION TARIFF/RIDER QFS (MARCH 21, 1985, DOCKET NO. 8412-1239) TO IMPLEMENT THE OPTION OF NET ENERGY BILLING AT A RATE EQUAL TO THE UTILITY'S EFFECTIVE RETAIL RATE FOR THE CUSTOMER, WHICH SHALL APPLY FOR ANY SMALL POWER PRODUCTION FACILITY.

THE BPU SHALL REVIEW EACH CONTRACT FOR CAPACITY, ENERGY OR BOTH FOR ANY COGENERATION FACILITY OF 1 MW OR GREATER THAT IS FINANCED OR OWNED IN PART BY THE SUBSIDIARY OF AN ELECTRIC UTILITY. THE BPU SHALL DETERMINE WHETHER THE UTILITY OFFERED ANY PREFERENCE TO THE PROJECT THAT IS NOT AVAILABLE TO NON-UTILITY UNITS, AND SHALL, IF IT SO FINDS, DISAPPROVE OF SAME OR IMPOSE SUCH NEW STANDARDS AS IT FINDS APPROPRIATE.

THE BPU SHALL PROVIDE 30 DAYS FOR ANY PERSON TO PROTEST THE AWARDING OF ANY CONTRACT TO ANY COGENERATION FACILITY THAT IS FINANCED OR CONSTRUCTED IN WHOLE OR PART BY A UTILITY SUBSIDIARY.

ATTACHMENTS

March 12, 1987	New Jersey State Chamber of Commerce New Jersey Business & Industry Association Chemical Industry Council of NJ New Jersey Petroleum Council	Gov. Kean
March 5, 1987	R. Kostal & J. Koerber-Energy Factors R. Neary-Energy Factors R. Neary-Energy Factors	NJDEP NJDECED NJDEP
February 9, 1987	R. Kostal-Energy Factors	NJDEP
February 5, 1987	National Assn. Energy Service Companies	NJDEP
February 2, 1987	Cogeneration Coalition of America	NJDEP
January 21, 1987	Energy Factors (testimony)	NJDEP/ DECED
January 21, 1987	R. Kostal-Energy Factors	NJDECED



NEW JERSEY STATE
CHAMBER OF COMMERCE
GOVERNMENTAL RELATIONS OFFICE
315 WEST STATE ST.
TRENTON, N.J. 08618 • (609) 989-7888

March 12, 1987

Honorable Thomas H. Kean
Governor
Office of the Governor
State House
Trenton, New Jersey 08625

RE: Cogeneration Regulation

Dear Governor Kean:

As representatives of most of the major business organizations in the State, we have undertaken this unusual effort to jointly bring to your attention an issue currently before the New Jersey Departments of Environmental Protection and Commerce which will have a major effect on the business community and climate in New Jersey. Specifically, we are referring to a proposal by the Department of Environmental Protection relating to the use of the selective catalytic reduction ("SCR") technology or its performance equivalent as a pollution control strategy for cogeneration facilities. We oppose implementation of this technology.

Your Administration has been a welcome proponent of cogeneration. In a State like New Jersey which must impose additional operating requirements on industry in order to protect the quality of its environment, the cost-saving aspects of cogeneration technology represent a unique opportunity to improve the competitive position of New Jersey business operations. In addition to the obvious cost savings, cogeneration represents a more efficient use of our energy resources and, on balance, a far cleaner method of power generation. Cogeneration becomes even more important to business where, as in New Jersey, energy costs are much higher than the national average.

Honorable Thomas H. Kean
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We oppose the immediate implementation of SCR or equivalent performance requirements for two primary reasons: cost and fairness.

The performance requirements are extremely expensive to implement with as yet still uncertain environmental benefits. Indeed, in some configurations the result of the proposal by DEP would be increased air pollution, when all factors are considered. The proposal is beyond the state of the art in terms of its technical possibility of attainment, its overall benefit, its cost, and the certainty of its benefits. While we believe that some new performance requirement may be appropriate in the long term, the processes themselves are still evolving and we are not convinced that the technology is totally workable or demonstrated in its present form. The imposition of a costly, evolving performance requirement on an already marginal industry could have disastrous effects on the implementation of present and future cogeneration projects in the State.

As to the fairness issue, cogeneration projects involve a substantial amount of technical and financial planning prior to their submittal to the State for permitting purposes. Significant amounts of money and time are invested in these projects, based upon an existing set of regulations. We cannot condone a regulatory process which would impose new standards on pending permit applications or on those projects in the final stages of design and financial planning. The business community must be assured of continuity in the regulatory environment if timely, cost-effective compliance is to be achieved.

We, therefore, recommend that any State position on the implementation of SCR or equivalent performance requirement be proposed as a formal rulemaking and held out for public comment and review. Those projects which were designed and approved by the technical and financial community under the existing regulations should be allowed to go forward under the existing regulatory scheme. Should the rulemaking process result in a change in the regulatory program for cogeneration, that change should be prospective only, thereby allowing the technical and financial communities to plan for the existence of the new regulations. This "grandfathering" of existing projects under the existing regulatory scheme poses little, if any, environmental problems, while assuring substantial energy and cost savings to the business community of the State of New Jersey.

Cogeneration projects planned or proposed amount to almost 2500 megawatts of energy with a total capital investment exceeding \$1 billion in the State of New Jersey. Thousands of jobs are directly affected by the implementation of this technology. As you stated in your most recent State of the State message, economic development, job creation and job retention are important elements of your Administration. A sensible cogeneration program enhances these goals, an unrealistic program can only retard them.

Honorable Thomas H. Kean
March 12, 1987
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On behalf of the business community in this State, we urge you to consider this letter and adopt our position regarding the implementation of cost-efficient, environmentally-sensitive cogeneration projects in the State of New Jersey. These are not the kinds of issues which should be left to litigation for final resolution. We believe our suggested approach is a reasonable, balanced program, taking into account the interests of all parties. We respectfully request that your administration consider and adopt this program as proposed.

Sincerely,

NEW JERSEY STATE CHAMBER OF COMMERCE

By: James M. [Signature]

NEW JERSEY BUSINESS AND INDUSTRY ASSOCIATION

By: Bruce B. [Signature]

CHEMICAL INDUSTRY COUNCIL OF NEW JERSEY

By: A. C. [Signature]

NEW JERSEY PETROLEUM COUNCIL

By: James E. [Signature]

NJR

March 5, 1987

85.111

85.038

Federal Express

Mr. William J. O'Sullivan
Division of Environmental Quality
New Jersey Department of Environmental
Protection
401 East State Street, CN 027
Trenton, NJ 08625

Dear Mr. O'Sullivan:

Thank you for the opportunity of meeting with you last Monday to discuss your draft policy for controlling NO_x emissions from gas turbine cogeneration facilities. Our understanding is that your draft policy breaks the gas turbine heat input into three groups as follows:

1. Under 100 MMBTU/hr. Maximum NO_x emission of 0.2 pounds NO_x per 1 MMBTU when gas firing and 0.4 pounds when oil firing.
2. Between 100 and 250 MMBTU/hr. Same as above until May 1, 1992 when all units will have new criteria of 0.1 pounds of NO_x per 1 MMBTU when gas firing and 0.2 pounds when oil firing.
3. Over 250 MMBTU/hr. Criteria is 0.1 pounds and 0.2 pounds when oil firing. If a technology other than SCR is used, phase in time will be allowed to reach this criteria.

We understand further that this draft policy is proposed to be retroactive to permits already submitted and will be used to determine permitting in lieu of the information provided to us prior to and at the time of submittal of the Kenilworth project application.

Summarizing our position, we believe that permits already submitted should be issued assuming they meet the criteria established during their development; that is, at the time of application submittal. The change in criteria should be reviewed in some form of public format and applied to permits submitted after the issuance of new criteria.

Mr. William J. O'Sullivan
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Our Kenilworth project falls in the 100 to 250 MMBTU category. As we explained in our meeting with you, your draft policy would require that we choose either steam injection or SCR now, not five years from now.

We understand you believe the 1992 requirement would allow us to try steam injection for five years and then change to SCR if it did not work. We explained this would not work for the following reasons:

1. Each system configuration (water injection, steam injection, and SCR) has unique equipment layout requirements. Each requires a different design for the heat recovery boiler. Steam injection requires a completely different steam system (which includes HRSG, piping, steam turbine, condenser, water treatment, etc.) because of the high amount of high pressure steam required for injection into the gas turbine (20,000 to 25,000 pph for the LM2500). The project cannot bear the cost of trying steam injection now and changing to SCR later.
2. We cannot purchase a guaranteed performance, dual fuel fired, steam injected turbine to meet your criteria. GE says the LM2500 dual fuel engine can be made to attain 75 ppm with steam injection at best.
3. The financial community will require equipment supply contracts and plant design to meet all permit criteria during the debt repayment period.
4. The delay required for redesign (up to six months) may cause our project to default on several key contractual dates.

Therefore, your draft policy is, in effect, de facto SCR from day one. We understand this was not your intention. However, even this option may cause our project to fail due to economics, defaulted schedule dates as mentioned previously, and as described in our previous correspondence.

Our discussion demonstrated the need for a full and open sharing of information. It is apparent to us that your group needs much better understanding of the following items:

Mr. William J. O'Sullivan
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1. Strict definition for the heat input criteria (we recommended Lower Heating Value [LHV] as the basis because of its conventional use with gas turbines; that is, manufacturers' brochures and guarantees. Also, FERC cogeneration qualifying ratios are calculated based on LHV. We also recommended nominal performance at ISO conditions as the basis to avoid potential misinterpretations.)
2. Equipment currently available from all potential suppliers and the level of emissions those suppliers are willing to guarantee, especially with dual fuel firing (a necessity in New Jersey because of the curtailment in gas supply).
3. Emission levels that manufacturers believe they can meet given a reasonable time period and market potential.
4. System design, equipment selection, plant layout, and financial requirements needed to change immediately from water injected to either steam injected or SCR, or to add SCR at a later date.
5. Financial requirements to obtain construction funding for projects based on permits with changing criteria.

To support you properly in this information search, we need to understand your decision processes, the technical and economic criteria applied, and your mandates and obligations. Additionally, it is our perception that your draft policy will be applied as "rules" and not as "guidelines" to all future permit applications. Guidelines imply a flexibility we did not discern. Therefore, given the enormity of the impact on cogeneration and its impact on the economic health of New Jersey, we believe this discussion must be done in some form of an open forum.

To support your goals and encourage the benefits of cogeneration to continued economic growth in New Jersey, and to allow projects with pending permits to move forward, we suggested the following modifications to your draft policy:

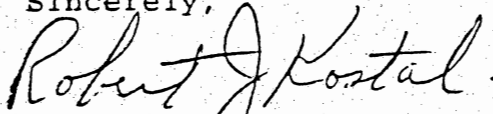
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March 5, 1987
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1. For 100 to 250 MMBTU heat inputs, develop a true "phased-in" requirement that cogenerators, equipment suppliers, and the financial community can support. For example, establish .2 lb NO_x per 1 MMBTU gas input/.4 lb NO_x per 1 MMBTU oil input for permits submitted in 1987; .18 lb NO_x per 1 MMBTU gas input/.36 lb NO_x per 1 MMBTU oil input for permits submitted in 1988; and so forth down to .1 lb NO_x per 1 MMBTU gas input/.2 lb NO_x per 1 MMBTU oil input for permits submitted after 1991.
2. Consideration be given to utility emissions offsets (under consideration in California).
3. Emissions compensation for the use of more highly efficient plants (for example, combined cycle plants provide more efficient use of fuel than simple cycle plants).

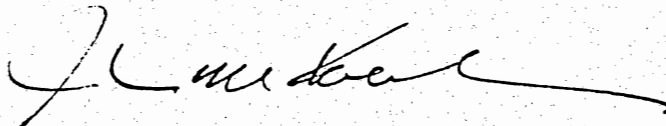
These are concepts that we can and are willing to support. We would like to direct our energy and efforts to building the plants we have proposed while supporting your efforts in moving toward an equitable and reasonable path for an even further improved environment.

You advised you are working on our Kenilworth permit application and will write us by March 13, 1987 with modeling and engineering review comments. We respectfully request that you issue the Kenilworth permit in accordance with the guidelines you established for its submittal and we trust your decisions regarding new guidelines for future work will find us working together for improved economic and environmental goals in New Jersey.

Sincerely,



Robert J. Kostal
Business Development Manager



John M. Koerber
Project Manager



Mr. William J. O'Sullivan
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copies (by Federal Express):

Mr. Jorge Berkowitz
Director, Division of Environmental Quality
New Jersey Department of Environmental Protection
401 East State Street, CN 027
Trenton, NJ 08625

Mr. Borden R. Putnam
Commissioner
New Jersey Department of Commerce and Economic Development
One West State Street, CN 820
Trenton, NJ 08625

Robert J. Neary
Vice President
Project Management & Engineering

March 5, 1987
85.111
85.038

Federal Express

Mr. William J. O'Sullivan
Division of Environmental Quality
New Jersey Department of Environmental
Protection
401 East State Street, CN 027
Trenton, NJ 08625

Dear Mr. O'Sullivan:

As you are aware, Energy Factors has an extremely vital interest in cogeneration development in New Jersey where it can serve to improve the financial viability of organizations such as Schering-Plough. We accomplish this by building an efficient, well-designed cogeneration plant at the site of a "host," such as Schering, which we will own and operate for 20 years. As a result, we are committed to a long-term interest in the areas where our plants are located.

The Schering plants at Kenilworth and Union are of great importance to us because they are our first plants in New Jersey. These projects have been under development for several years and Energy Factors has spent to date on them approximately \$1 million. We have executed all but one of the contracts necessary for implementation and we are poised to give our contractors a Full Notice to Proceed. The first level design of these plants is complete and major equipment is on order with penalties for delay or cancellation.

The single most important document that prevents us from moving ahead on these projects is the Permit to Construct. We recognize the important issues surrounding the protection of the environment and I am sure you recognize the difficult business position in which we find ourselves with our projects suddenly put in a state of suspended animation. I am sure we feel confident and are in agreement that a rapid resolution of the present issues, done on the basis of accurate and complete information, will benefit all parties.

I commit to you that Energy Factors will continue to work with your organization to supply you with whatever information you require or desire so that the present issues can be resolved and we can again move forward on these projects.

Mr. William J. O'Sullivan
March 5, 1987
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I am encouraged by the reports from our Project Manager for the Schering projects, John Koerber, and our East Coast Business Development Manager, Robert Kostal, concerning their meeting with you and your staff on March 2, 1987. They inform me that processing is now underway on our Kenilworth application and that within two weeks we will have written comments from your department.

Energy Factors is very willing and ready to support your efforts to define future emissions goals for New Jersey. Please feel free to contact me or John Koerber for information you may require.

Best regards,



Robert J. Neary
Vice President
Project Management & Engineering

lf 05871

c: Mr. Jorge Berkowitz
Director, Division of Environmental Quality
New Jersey Department of Environmental Protection
401 East State Street, CN 027
Trenton, NJ 08625

Mr. Borden R. Putnam
Commissioner
New Jersey Department of Commerce and Economic Development
One West State Street, CN 820
Trenton, NJ 08625

John Koerber
Robert Kostal

Robert J. Neary
Vice President
Project Management & Engineering

March 5, 1987
85.111
85.038

Federal Express

Mr. Borden R. Putnam
Commissioner
New Jersey Department of
Commerce and Economic Development
One West State Street, CN 820
Trenton, NJ 08625

Dear Commissioner Putnam:

On behalf of the management of Energy Factors, I thank you for your interest in the air permitting issue now at hand with the New Jersey Department of Environmental Protection (NJDEP) and appreciate your support.

As you are well aware, the NJDEP is in the process of proposing mandatory emissions controls for cogeneration projects in New Jersey. Most troublesome is the fact that this proposed policy, as presently understood, will be retroactive to projects that have been planned carefully and developed following all existing laws and regulations as well as NJDEP guidance and comments.

Recent meetings have indicated that Energy Factors may be able to assist the NJDEP with information about equipment, process design, and financial requirements that will assist them as they make decisions concerning emissions controls.

I commit to you that Energy Factors stands ready to supply this assistance. During this effort, we would hope to learn more about the NJDEP's processes and criteria so that any information we supply would be thorough and complete.

In developing new technologies, companies such as Energy Factors need to be able to reasonably depend upon some degree of stability within the permitting and regulatory environment so that it can proceed with its technical and financial planning. Having these rules changed without warning and in a manner such that the project is placed in a state of suspended animation causes us great hardship. We believe there must be a way to meet the legitimate concerns about the environment without seriously delaying or perhaps depriving Energy Factors and Schering-Plough of a significant business opportunity.

Mr. Borden R. Putnam
March 5, 1987
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We ask your support as we continue to work with the NJDEP to attempt to convince them the equitable and proper way to address these concerns is the following:

1. Process previously submitted permits in accordance with the rules, regulations, and NJDEP guidelines that were (and still are) in effect at the time of submittal.
2. Conduct public hearings to develop a reasonable plan for improved emission levels and have this plan put into effect in a phased manner with transition rules.

Thank you for interest and we look forward to your continuing support.

Very truly yours,



Robert J. Neary
Vice President
Project Management and Engineering

lf 05881

c: Mr. William J. O'Sullivan
Division of Environmental Quality
New Jersey Department of Environmental
Protection
401 East State Street, CN 027
Trenton, NJ 08625

February 9, 1987

Mr. Jorge Berkowitz
Director, Division of
Environmental Quality
New Jersey Department of
Environmental Protection
401 East State Street, 2nd Floor
Trenton, New Jersey 08625

Mr. Henry T. Blekicki
Assistant Commissioner
New Jersey Department of
Commerce and Economic
Development
101 Commerce Street
Newark, New Jersey 07102

Dear Sirs:

Pursuant to an announcement dated January 12, 1987, the Director of the Division of Environmental Quality of the New Jersey Department of Environmental Protection ("NJDEP") and the Assistant Commissioner of the New Jersey Department of Commerce and Economic Development ("NJDCED") called for an informational meeting to be held in Newark on January 22, 1987 to address issues relating to cogeneration arising out of the NJDEP's consideration of the use of selective catalytic reduction technology ("SCR") to reduce nitrogen oxide emissions ("NO_x").

Energy Factors, Incorporated ("EFI"), a California corporation engaged in the business of developing, owning and operating alternative energy production facilities throughout the United States, including two cogeneration facilities under development in the state of New Jersey (see Section 1 below), attended the January 22, 1987 meeting and made an oral presentation and written submission at that time. EFI was invited to supplement its presentation with such additional information that might be useful to the NJDEP and NJDCED in the formulation by each such department of its policies regarding cogeneration and NO_x emissions controls.

Messrs. Berkowitz and Blekicky
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EFI appreciates the opportunity to submit this information to the NJDEP and the NJDCED, and would be pleased to participate further in the public portion of the state agency decision-making process.

In summary, EFI believes that the costs and uncertainties surrounding the application of SCR to cogeneration facilities require substantial additional investigation, including formal public notice and comment procedures, before any informed policy regarding the use of SCR can be adopted by the NJDEP. The need to further investigate the costs and benefits of SCR should not, however, be allowed to delay the development of proposed cogeneration facilities that offer substantial economic and environmental advantages for the state of New Jersey, or to unduly jeopardize the significant investments of time, effort and finances already committed to such projects. The NJDEP should make every effort to promptly process pending applications relating to the construction of cogeneration facilities in New Jersey, and to issue permits to those facilities whose applications reflect compliance with existing law. EFI's views are set forth below in greater detail.

Section 1. Background

EFI's commitment to the development of cogeneration in New Jersey dates to the summer of 1985, where EFI representatives commenced discussions and negotiations with a variety of potential industrial steam and electricity customers throughout the state, and with local utilities regarding the purchase of excess power. By the fall of 1985, EFI was fully engaged in developing a 7 megawatt (net) facility to serve the Schering Corporation plant in Union, New Jersey through its project subsidiary, EF Union, Inc. ("EFUI") and in developing a 25 megawatt (net) facility to serve the Schering Corporation plant in Kenilworth, New Jersey through its project subsidiary, EF Kenilworth, Inc. ("EFKI"). EFI has maintained an office in Iselin, New Jersey since early in 1986 to develop these and other east coast projects.

During the course of the past fifteen months, EFI has entered into an energy services agreement and a site lease with Schering Corporation for each project, and a power purchase agreement with Jersey Central Power & Light Company ("JCP&L") for each project. A construction contract has been signed with EBASCO Constructors, Inc. for the Kenilworth project, and with Turbosystems, International ("TSI") for the Union project. A transmission and service agreement for each of the projects is

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being negotiated with Public Service Electric and Gas Company ("PSE&G"), and fuel supply arrangements are being made for the delivery of gas to the projects.

EFI has already made payments to EBASCO, TSI, and PSE&G for work performed under the project contracts. EFI has expended to date well over \$1 million in the development of these projects, much of it allocated to the design of the two facilities to achieve project goals within given economic constraints and in compliance with existing laws bearing upon the design, construction and operation of cogeneration projects in the State of New Jersey. EFI is now contractually committed to the expenditure of at least \$40 million in the completion of these two facilities. The Kenilworth plant is projected to begin serving Schering and providing electricity sales to Jersey Central Power & Light by July 1988, and the Union plant is expected to be on line by December, 1987.

In planning for its development effort EFI reviewed from the beginning of its involvement in New Jersey the environmental constraints that it would face in proceeding with the two projects. EFI's decision to commit itself to cogeneration in New Jersey was premised upon its ability to design, construct and operate an economic facility in compliance with existing environmental law. To this end, EFI and its New Jersey environmental consultants, Envirosphere/EBASCO (Kenilworth project) and TSI/Energy Services, Inc. (ESI) (Union project), have consulted with the NJDEP and confirmed that the emissions control technology incorporated into the project design, which does not include SCR, would satisfy applicable New Jersey law. For the Kenilworth project, EFI negotiated a detailed turnkey engineering, procurement and construction contract with EBASCO on this basis and prepared and submitted its air permit application accordingly. For the Union project, EFI has a similar arrangement with TSI and will be submitting the air permit application in early February 1987.

In preparing its air emissions permit application, EFI met on several occasions with the NJDEP, and directly, or through Envirosphere and ESI, had numerous telephone conversations and correspondence with the agency regarding applicable air emissions requirements. Throughout this period, EFI sought and received assurances that neither the Kenilworth project nor the Union project would be subject to SCR. In addition, EFI's discussions with the NJDEP consistently reflected the necessity of a prompt disposition of the permit application in order to

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permit the timely release of project contractors and the completion of the projects by the deadlines provided for in the relevant project agreements described above. (see attached)

EFI understands that consideration is now being given to adopting new rules requiring the utilization of SCR in cogeneration projects to be constructed in New Jersey, and to suspending the processing of air permit applications now pending before the NJDEP until a determination on SCR has been made. The following section sets forth EFI's views on these issues.

Section 2. SCR should not be adopted by the NJDEP without extensive further study and opportunity for public participation.

A. Adoption of an SCR standard at this time has not been demonstrated to be a justifiable need or advantage.

EFI understands that the motivation underlying the consideration by the NJDEP on the adoption of SCR with respect to NO_x emissions is the concern of the NJDEP that the state of New Jersey will be unable to meet federally-mandated ozone pollution standards and therefore, will be subject to sanctions imposed by the United States Environmental Protection Agency ("EPA") including the loss of federal highway funds, and that the adoption of SCR will help prevent the imposition of such sanctions to the extent the ozone levels will be reduced.

Whether the EPA will consider the imposition of sanctions on New Jersey, and what the NJDEP and NJDCED can do to avoid sanctions and to achieve compliance with federally-mandated air pollution standards is appropriately of concern to these agencies. Whether the adoption of an SCR policy will achieve these ends is another question altogether. The relationship between NO_x emissions and ozone pollution is complex and not well understood, so any NJDEP actions to reduce NO_x, whether by SCR or otherwise, to satisfy federal ozone pollution requirements, may well be subject to challenge on such grounds.

With respect to the issue of state compliance with federal standards, it has yet to be conclusively established that SCR is state of the art or the best available control technology ("BACT") to reduce NO_x emissions in New Jersey and for the NJDEP to impose an unproven technology on the cogeneration industry would be both premature and unjustifiable.

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Further, given the magnitude of the ozone pollution problem and the lack of informed consensus with respect to its causes and possible and practical solutions, there is considerable speculation as to whether any sanctions or enforcement actions are likely to be forthcoming from the EPA.

The NJDEP should clarify the reasons for which it is moving at this time to adopt SCR technology. To attempt to adopt a policy with such adverse effects on the development of cogeneration in New Jersey without clear authority and justification would be indefensible as a matter of good policy and law.

B. The available data relating to the costs and disadvantages of SCR precludes adoption of an SCR standard at this time.

SCR remains unproven as a technology suitable for adoption by the NJDEP for mandatory incorporation into New Jersey cogeneration facilities. The uncertainties surrounding SCR, the benefits of its adoption, and its effect on cogeneration plant costs and revenues are so substantial as to preclude the adoption by the NJDEP of an informed and defensible SCR policy without extensive further study.

Much of the available data on SCR is derived from Japanese and California operations experience. With respect to the Japanese data, there was testimony at the January 22, 1987 hearing questioning the accuracy of the documentation. Data derived from SCR utilization in both Japan and California may not be relevant to the New Jersey environment. A study needs to be made to determine if the technology transfer is applicable to the size, intended load use (base load versus load following) and fuel supply problems of the proposed New Jersey facilities. The extremely limited California data base indicates severe problems occur with SCR when burning liquid fuel and when operating off design as is required for most cogeneration plants.

The effect on SCR of the extreme seasonal variations experienced in New Jersey is projected to be significant, largely because of the economic requirement for plants to switch to oil-fired operation when gas supplies are interrupted during extremely cold periods.

Natural gas supply in New Jersey, although significantly improved over the situation of the early 1970s, is still basically an "interruptible" supply for industrial and cogeneration uses. Recent supply history and projections

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furnished to Energy Factors by Elizabethtown Gas Company relative to industrial or transportation services indicates that we must be prepared for 22-44 days of natural gas curtailment at the Schering projects depending on the severity of the winter. The alternate fuel for gas turbines is a #2-type fuel oil. Elizabethtown Gas Company is proposing a firm service cogeneration rate, which if approved, would be available for roughly \$4.00-\$4.20 per million BTU versus the available interruptible gas currently in the \$2 per million BTU price range for contract carriage users. Although additional transmission pipeline projects may alleviate some of the curtailment concerns in the future, New Jersey industrial and cogeneration users will still be primarily on an "interruptible" service. Fuel/oil will necessarily be utilized as a standby fuel in most major cogeneration facilities.

Additionally, the purchase prices paid for electricity by California utilities to cogenerators under the available standard options are sufficiently generous as to allow the incorporation of SCR technology at an economically acceptable cost, especially for the larger projects that characterize California cogeneration activity.

Energy Factors does not currently have gas turbine powered plants in operation with SCR, but is in the early stages of development of plants that will require SCR. SCR was a known requirement going into these project and, although these projects will have the relatively higher electricity purchase rates mentioned above, EFI is concerned with the effect SCR will have on the economic viability of these projects and the ability to obtain attractive financing.

C. The adoption of SCR will have a material adverse impact on the development of cogeneration in the state of New Jersey

Whether and to what extent the adoption of SCR would accomplish the narrow pollution control goals desired by its proponents is uncertain. That it would have a significant adverse economic impact on the development of cogeneration for a critical segment of the industry in New Jersey is without doubt.

The incorporation of SCR controls into a cogeneration facility involves increased capital costs for design, engineering procurement and construction. The management of a plant with SCR involves significant increased direct operating costs for catalyst purchase and disposal (spent SCR catalyst is

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considered hazardous) and additional system repair and maintenance. The facility also has increased indirect operating costs from financing expenses attributable to the increased capital costs and project risk and reduced operating revenues arising from increased down-time for system repair and maintenance and unreliability. SCR also imposes additional back pressure on the gas turbine, which reduces facility power output. These issues are addressed in the State of the Art Review submitted with the Kenilworth application.

The increased costs attributable to SCR include not only the direct and indirect investment and cash flow costs cited above, but also the transaction costs arising from the added difficulty of attracting reasonable and economic project financing for the facility. Were EFI or any other cogeneration project developer or sponsor to bear the full cost of project construction and operation, the added costs and risks presented by the incorporation of SCR would be integrated into the project risk/return calculations by the party principally responsible for achieving project success or failure, and a decision to proceed or not would be made on that basis.

Most cogeneration projects are not self-financed, however, but funded by the financial community, which is significantly less inclined to assume a given degree of risk than the developer/owner/entrepreneur. Consequently, the impact of increased cost or risk on the financeability of a project is, at the least, higher interest rates and more restrictive financing conditions, and, when the perceived risks or uncertainties become unacceptable, the project is not financeable.

The incorporation of SCR into a cogeneration project is viewed by the financing community with concern (see the Kidder Peabody letter dated January 30, 1987, attached). Adoption of an SCR standard by the NJDEP will accordingly further limit the ability of the cogeneration industry to make its unique and valuable contribution to the people and economy of New Jersey.

D. Significant policy issues remain to be resolved with respect to SCR and cogeneration

The uncertainties relating to the formulation and adoption of an informed SCR policy by the NJDEP extend beyond the review of available data to the development of relevant policy options to be considered by the state agencies concerned with the encouragement and regulation of cogeneration in New Jersey. Numerous significant policy issues relating to SCR remains to be resolved, including the following:

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* Should SCR be required only for cogeneration facilities:

- of a given size or greater (50 megawatts)?
- which can remain economic after incorporation of the technology?
 - as determined on a case-by-case basis
 - as determined on the basis of cost/benefit formula (cost/pound of NO_x removal) with a fixed or variable bench mark

* Are there other NO_x sources that should be subject to stricter emissions technology standards before imposing such standards on the cogeneration industry--for example, automobiles, as was done in California?

* To require the cogeneration industry, with its economic environmental energy and social benefits, to solely bare the burden of such an expensive technology, would be inconsistent with the goals of New Jersey public policy.

E. The factual and policy uncertainties raised by consideration of the SCR/cogeneration issues must be addressed through a comprehensive agency rule-making process involving public participation

Whether and on what terms an SCR policy may be adopted by the state of New Jersey is of great consequence to the cogeneration industry, and the extent to which development and state regulation encourages or hinders the utilization of cogeneration facilities in New Jersey will have significant consequence for the construction, industrial, energy and environmental sectors of the state of New Jersey.

Certain of these issues involve the resolution of complex social, environmental and economic policy questions that warrant interagency consideration. The interest of the NJDCED in the development of cogeneration in New Jersey merits no less focus than the interest of the NJDEP in environmental matters.

The jurisdictional concerns of these state agencies are not the only interests affected by the resolution of these issues, however. The aggregate time, effort and expenditure of the staff of both agencies on these issues pales next to the efforts and expenses to date of the cogeneration industry in proceeding with the development of sorely needed generating

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capacity for the state of New Jersey, and those numbers are insignificant next to the committed projected expenditures for these projects under development. For the largest of these projects, the incorporation of SCR may be viable, but SCR threatens the very existence of the mid- to small-sized facility, including most facilities sized principally to serve a contiguous industrial steam and electrical load.

The potential impact of adoption of an SCR policy is to destroy the economic viability of an entire market segment, the sub-50 megawatt plant which exists principally to sell to an industrial user, and sells excess to the utility largely as a cost spreading device. The irony of this prospect is that it is precisely this industrial user with the need for energy savings which was the intended beneficiary of the passage of PURPA in 1978. Those who would be affected by the adoption of an emissions control technology that proved to be noneconomic for this strata of the market would include not only the cogeneration developer and the construction industry, but the industrial consumer who would have benefited from the energy savings that would have been generated by construction of the plant.

The presence of such a diverse array of public and private policy interests to be reconciled, and the tremendous amount of factual data and information to be developed, reviewed, verified, assimilated and applied to reaching a decision requires that a rule-making procedure be instituted that will accommodate the affected parties and interests and provide a process for working through the data assessment and policy taking steps which will lead to an informed and justifiable result.

The nature of the determination involved in this matter is clearly a rule-making process within the meaning of the Administrative Procedure Act of the State of New Jersey, N.J. Rev. State. § 52:14B-1 et seq., and requires, at a minimum, consideration consistent with the provisions of that statute. Only after the affected parties have had adequate facts and opportunity for notice and comment on the issues presented by this inquiry, and the relevant state agencies have been able to consider and make an informed determination on the evidence so addressed, can a rule with respect to SCR and cogeneration be effectively promulgated.

Section 3. An air permit should be issued promptly to allow EFI to proceed with the development of the Schering cogeneration projects in compliance with existing law

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A. Pursuant to the guidance and direction of the NJDEP, EFI has satisfied all requirements for an air permit, which should be issued expeditiously by the NJDEP

As set forth in greater detail in Section 1, EFI and its New Jersey environmental consultant, Envirosphere/EBASCO* have consulted at length with the NJDEP regarding permitting requirements for the Schering cogeneration projects. Following numerous meetings and telephone conversations with the NJDEP, including the review and revision of relevant protocols, a final application for an air permit for the 25 megawatt (net) Kenilworth project was submitted on December 3, 1986, and the application for the 7 megawatt (net) Union project will be submitted imminently. The Kenilworth application contains all of the information requested or required by the NJDEP, and shows that the proposed plant has been designed in compliance with existing rules and regulations regarding NO_x air emissions controls.

EFI has taken every possible step to cooperate and coordinate its actions with the NJDEP. In doing so it has incurred significant expense in retaining expert consultants and legal counsel to assist it in the preparation of its application. More significantly, EFI has suffered significant delays in the progress of its development schedule as it has sought to work with the NJDEP to obtain a permit to commence construction. EFI now runs the risk of breaching contract deadlines for the construction and operation of the Schering projects, and for the sale of electrical power and steam therefrom to Schering and to JCP&L. Further, the delays in initiating construction render EFI potentially liable for increased construction costs and penalties, all of which will have an adverse effect on project economics.

EFI recognizes the need of the NJDEP to review the permit application prior to the issuance of the permit, and remains willing to assist the NJDEP in this regard in any way possible. EFI has even offered to pay for the retention by the NJDEP of contractors to facilitate a prompt processing procedure in the event that NJDEP resources are inadequate to so serve the public interest, which fee-for-service approach has been successfully implemented by California state environmental authorities faced with staff and budgetary limitations. Whatever other constraints may bear upon the NJDEP, however, it must not suspend the prompt review and processing of pending air permit applications submitted under present rules and regulations while it undertakes its SCR rule-making effort.

*And TSI/ESI

ENERGY FACTORS

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No valid interest of the state of New Jersey is served by withholding an air permit for the Kenilworth project from EFI. Every day that passes without an air permit further jeopardizes EFI's ability to proceed with the construction of a facility that will add to the state tax base, provide construction jobs for at least a year, and result in significant energy savings for a valued member of New Jersey's industrial community. Prompt issuance to EFI of an air permit for the Kenilworth is in the best interests of the people and economy of New Jersey. EFI's permit processing should not be placed on hold while the NJDEP considers altering the law under which, with NJDEP's guidance and direction, EFI has prepared its application, and with which EFI is prepared to comply in the construction and operation of its Kenilworth facility.

B. EFI would be substantially adversely affected by any requirement to incorporate SCR into the Kenilworth project from this point onward

At the request of the NJDEP, EFI engaged in a detailed analysis of the impact upon the Kenilworth project of the incorporation of SCR as a NO_x emissions control technology. This analysis, which was conducted pursuant to the prevailing state of the art review ("SOAR") standards for pollution control, is included in the Kenilworth air permit application submitted to the NJDEP as Attachment C thereto, and indicates that the annual cost per pound of NO_x removed would equal \$5.33, which significantly exceeds the stated guideline for economic SCR operation of \$2.00- \$4.00.

The numbers used in the SOAR review section of the Kenilworth air quality permit application reflect the estimated NO_x removal cost assuming system design, engineering and procurement for SCR control from the beginning of project development. In fact, were EFI now required to incorporate SCR technology into the Kenilworth project, the cost would be substantially higher. EFI would be required to issue change orders to its turnkey construction contractor for the redesign and reengineering of the facility. This increased scope of work, together with the cost of attendant delay and resulting nonrecoverable operating deficiencies, has been estimated to result in an increase in the levelized annual costs of NO_x removal of approximately fifty percent.

EFI has no adequate contractual mechanism for the recovery of increased costs relating to the incorporation of SCR technology. While a coordinated intra-agency approach to the problem could potentially result in an increase in the power

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purchase price paid by JCP&L (with a flow-through to the rate base approved by the New Jersey Board of Public Utilities), no such regulatory mechanism exists to effect a comparable adjustment in the power purchase price paid by Schering, which constitutes the more significant portion (on a price per kilowatt delivered basis) of EFI's revenue stream. (EFI's Schering projects are designed to first provide for Schering's total electrical and thermal needs and to then sell the remaining electrical output to JCPL. Approximately 40 percent of the Kenilworth electrical output goes to Schering and over 90 percent of the Union electrical output goes to Schering.)

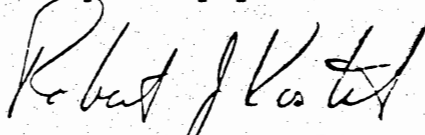
Finally, the current uncertainties regarding SCR are multiplied manifold when projected into the future. Whether equipment suppliers, supplies of catalyst, and spare and replacement control mechanism parts will be available and what they will cost is, given the lack of a well-established SCR industry, a matter of conjecture. Available data does not in any case provide a reliable base from which to derive credible capital and operating cost projections.

The financial community will not only be frightened of the high costs, but of the very uncertainty of predicting these costs. It is doubtful many currently mature and developing projects will proceed if subject to future addition of SCR.

EFI, which has done everything within its power to comply with the requirements of existing law in designing a \$30 million cogeneration facility for the Schering/Kenilworth project, and has invested in excess of two years of effort and \$1 million in development costs to date, should not now be forced to abandon this project because of a proposed change by the NJDEP of the air emissions rules now in effect in New Jersey.

If you need further assistance in this matter, please contact me.

Very truly yours,



Robert J. Kostal
Business Development Manager

3072D/lf
Enclosures

EF KENILWORTH INC. COGENERATION PROJECT

CHRONOLOGY OF ACTIVITIES WITH NJDEP

<u>Date</u>	<u>Activity</u>
10/85	Telephone conversations between EnviroSphere and various NJDEP staff members concerning air quality permit requirements for this project
09/11/86	Description of project, including approach for air quality evaluation and modeling protocol transmitted to NJDEP to Tom Micai (cover letter attached)
10/03/86	Meeting at NJDEP office in Trenton to discuss project description submitted 09/11/86. Summary of meeting discussion items sent to Tom Micai 10/14/86
10/13/86	Preliminary air quality modeling results submitted to NJDEP for review--cavity modeling (cover letter attached)
10/14/86	Minutes of meeting of 10/03/86 submitted to NJDEP (copy attached)
10/30/86	Preliminary air quality modeling results submitted to NJDEP for review--downwash modeling (cover letter attached)
11/06/86	NJDEP comments on modeling procedures/results received in phone conversation (summarized in memo of 11/10/86 from Fred Pope (EnviroSphere) to Ken Kinkela (Ebasco) (copy attached)
12/03/86	Air permit application and supporting information including modeling and SOAR transmitted to NJDEP (cover letter attached)
12/86 - 01/87	Various telephone conversations with Tom Micai and John Davis, summarized in letter of 01/12/87 from Fred Pope (EnviroSphere) to John Koerber (EFI) (copy attached)

EF KENILWORTH INC. COGENERATION PROJECT
CHRONOLOGY OF CONTRACTS AND PERMITS

<u>Date</u>	<u>Activity</u>
12/10/85	Sign Energy Services Agreement with Schering
12/10/85	Sign Site Lease with Schering
05/20/86	Sign Power Purchase Agreement with JCPL
06/20/87	Initiate Interconnect study with PSE&G
07/29/86	Sign Turnkey Contract with Ebasco
12/03/86	Air Quality Permit submitted to NJDEP*
12/04/86	Kenilworth zoning approval obtained
02/87	Anticipate signing of Wheeling and Grid Interconnect Agreement with PSE&G
03/87	Anticipate signing of Fuel Purchase Agreement(s) with fuel supplier(s)

*See Chronology of Activities with NJDEP

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February 5, 1987

Mr. Jorge Berkowitz
Director, Division of Environmental
Quality
New Jersey Department of Environmental
Protection
401 East State Street
2nd Floor
Trenton, New Jersey 08625

Mr. Henry T. Blekicky
Assistant Commissioner
New Jersey Department of Commerce
and Economic Development
101 Commerce Street
Newark, New Jersey 07102

Dear Sirs:

The National Association of Energy Service Companies (NAESCO) wishes to comment on the New Jersey Department of Environmental Protection's (NJDEP) consideration of the use of selective catalytic reduction (SCR) technology to reduce nitrogen oxide (NOx) emissions from cogeneration facilities in New Jersey. These comments are issued pursuant to the January 12, 1987 announcement by the Director of the Division of Environmental Quality of NJDEP and the New Jersey Department of Commerce and Economic Development (NJDCED), calling for an informational meeting on January 22, 1987.

Based on the outcome of that meeting, NAESCO wishes to provide comments to assist NJDEP and NJDCED in their consideration of SCR use in cogeneration facilities.

NAESCO is a District of Columbia nonprofit trade association with more than 110 members nationwide involved in all aspects of the energy service industry. NAESCO's members include energy service companies, contractors, energy management companies, financial institutions, utilities, insurance companies, federal, state and local officials, and others involved in the provision of cogeneration, alternative energy, and energy efficiency equipment and services. A list of NAESCO's members and Board of Directors is attached. NAESCO represents its members in matters relating to the development, ownership, construction, financing and management of energy services projects.

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In summary, NAESCO believes that while NJDEP's overall goal of seeking to control NOx emissions is sound, there are numerous uncertainties surrounding the use of SCR in cogeneration facilities. These uncertainties are sufficient to require further investigation and public review and comment before an official policy on the use of SCR in cogeneration facilities can be adopted by NJDEP. However, the need for further investigation and review of SCR policy should not delay the progress of cogeneration projects currently in operation and development in New Jersey.

NAESCO believes that NOx control policies should be developed on a comprehensive basis. All point and non-point sources should be viewed in a consistent context; the relative contribution to total NOx emissions of each source category should be examined in relation to the proven technical feasibility of control strategies, the cost per unit of emission reduction, and the other benefits derived from each source category. In such a context NAESCO believes that cogeneration facilities would not be a high priority source category for NOx emission reductions. The benefits created by cogeneration facilities in terms of increased energy efficiency, reduced energy costs, and contributions to the financial health of industrial and institutional facilities must be given full weight in evaluating NOx emission control options.

If after such a thorough and balanced evaluation process it is determined that cogeneration facilities must bear part of the responsibility for reducing NOx emissions, NAESCO and its members will actively comply with such a policy, providing it is promulgated and enforced in a fair and rational manner. However, at this juncture it is unreasonable to delay and possibly destroy cogeneration projects currently in operation and development in New Jersey on the basis of NJDEP's NOx emissions control policy development and evaluation process in its present state. NAESCO urges NJDEP and NJDCED to proceed with the permitting of cogeneration projects currently under development in New Jersey, as their clear energy, economic and social benefits outweigh the unclear benefits and significant (and potentially prohibitive) costs of current SCR NOx control technology.

Disabling the development of cogeneration facilities would send a negative message to New Jersey's larger energy users. Cogeneration has developed in New Jersey because its electric rates are among the highest in the nation. According to a 1984 survey of industrial electric rates, New Jersey ranked fifth among the states (based on Public Service Electric and Gas rates). Industrial users have sought relief from these high prices through increased energy efficiency and cogeneration. If cogeneration were to become economically unfeasible due to NOx

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control technology requirements, the state's economy could suffer significantly, through reduced production, plant closings or plant relocation. This impact should be weighed very carefully before imposing a major new cost burden on cogeneration facilities in the form of SCR controls for NOx emissions reduction.

NAESCO is grateful for the opportunity to comment on this important issue, and would be happy to provide additional information should NJDEP or NJDCED deem it worthwhile.

Respectfully submitted,

National Association Energy
Service Companies

By: _____
Anita S. Duckor, President

Cogeneration Coalition Of America, Inc.

2 Lafayette Centre
1133 21st Street, N.W.
Suite 500
Washington, D.C. 20036
Phone (202) 887-5200

To: Bob Kusyal
From: Mike Murray.
File: SCR.
c/c Henry, Williams

**WRITTEN COMMENTS OF THE
COGENERATION COALITION OF AMERICA, INC.**

ON

**SELECTIVE CATALYTIC REDUCTION (SCR)
AS BEST AVAILABLE CONTROL TECHNOLOGY (BACT)
FOR COGENERATION FACILITIES IN NEW JERSEY**

BEFORE THE

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP)

February 2, 1987

The Cogeneration Coalition of America, Inc. (Coalition) respectfully submits these written comments to assist the DEP evaluation of the propriety of SCR technology as BACT for cogeneration facilities in New Jersey. These written comments are intended to supplement the comments developed in the informal workshop on this matter related to SCR control technology and cogeneration facilities jointly conducted by the DEP and the Department of Commerce and Economic Development (DCED) on January 22, 1987.

Statement of Interest

The Coalition is a non-profit organization comprised of industrial users, gas utilities, equipment manufacturers, project developers and engineering and design firms which support the development of cogeneration and small power production resources nationwide. Since 1980, the Coalition has worked to support the removal of unnecessarily restrictive federal and state regulatory barriers to cogeneration and small power production development. The Coalition has also established relationships with other associations and groups supporting full development of national cogeneration and small power production potential.

Our members currently develop or operate cogeneration and small power production projects in many states, including New Jersey. The Coalition also appeared at recent hearings and filed written testimony in September, 1985 before the New

Jersey Department of Energy on the State Energy Plan, and just filed written testimony before the New Jersey Senate Energy and Environment Committee in January, 1987 on electricity reform legislation.

Coalition Opposes SCR Requirements for Environmental Permits

The Coalition expresses its strong opposition to imposition of SCR as BACT for NO_x emissions from planned cogeneration facilities in New Jersey. *While many parties have commented on technical and economic considerations at the informal workshop, the Coalition in these comments maintains that the imposition of SCR would be wrong as a matter of law. In this process, we fully endorse the testimony of many of these parties highlighting the technical and economic inadequacies of SCR as BACT. Even the Environmental Protection Agency (EPA) would not endorse the technical or economic operating attributes of SCR, nor are we aware that the EPA Region II, or any other EPA region, has formally endorsed and characterized SCR as BACT for cogeneration facilities.

This DEP Proposal Contravenes a State History of Regulatory Flexibility

The DEP support for SCR contravenes a state history of flexibility and regulatory prudence in the implementation of air quality standards. For instance, New Jersey allows application of the bubbling concept and emissions offsets as indicated in its definition of banking, N.J.A.C. 7:27-8.1. The State provides for inclusion of a fee amount in applications for a bubble permit, N.J.A.C. 7:27-8.6, and has fairly detailed guidelines for measuring emissions offsets, N.J.A.C. 7:27-18.1, et. seq. While reducing or offsetting the level of emissions is not dispositive as a matter of law for the choice of a pollution control technology, the flexibility and restraint shown in these other areas should also be reflected in this BACT determination process. New Jersey's regulations for permits and certificates set forth use of control technology that "incorporates advances in the art of air pollution control developed for the kind and amount of air contaminant entitled by the applicant's equipment," N.J.A.C. 7:27-8.5(b). But there is no body of evidence supporting such a determination for SCR in this instance, nor does the weight of the evidence presented on January 22, 1987 support such a finding.

Moreover, as a delegated state, the DEP acts as an agent for the EPA, 40 C.F.R. 360.4 (1985). Since EPA has never ruled, nor supports, SCR as BACT in Region II, or nationwide,

the DEP should be bound by that EPA position and permit other control strategies and technologies of proven record for NO_x emissions.

DEP Has Failed to Satisfy Statutory
Tests for BACT Determination

The term "best available control technology" is defined in the Clean Air Act, 42 U.S.C.A. §7479(3) (1985), as:

. . . an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this chapter emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is available for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of each such pollutant. . . .

The DEP has failed to provide any formal notice of permit actions related hereto and an appropriate period for public comment and the development of responsive testimony, 40 C.F.R. §124.10 (1985). Instead, absent this informal workshop which was independently sought by the DCED, the DEP Staff has informally sought the application of SCR technology on cogeneration facilities within the State. Absent adherence to these procedural requirements to preserve due process and maintenance of the statutory requirements, how has the DEP conducted a proper case-by-case review? Where are the DEP evaluations, analysis and assessments taking into account energy impacts, and the requirements of the State Energy Plan? Environmental impacts? Economic impacts? Other cost impacts? What analysis and assessments has DEP conducted on production processes and methods, systems and techniques for pollution control?

The answer appears simply none, and in the process the DEP has violated the federal and state requirements under the Act, and the EPA's own guidance on BACT, which is clearly not SCR. If the BACT Clearinghouse itself verifies that the DEP has not proposed the same technology as EPA has accepted on prior permits, a formal opinion should be solicited from EPA Region II before any further action is undertaken, if DEP plans to proceed further with SCR. As a delegated state the DEP should

follow EPA's guidance, which should provide technical advice as authorized by EPA regulations, 40 C.F.R. §80.6 (1985).

Complexity of Issues Demands Formal Hearing
Process if SCR Is Approved

The record developed at the informal workshop confirms the complexity of these issues associated with an SCR BACT determination. If EPA Region II fails to reject SCR as BACT, a more formalized hearing process is required to explore such issues as:

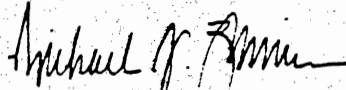
- (1) The Japanese and California data base -- is it relevant and meaningful to New Jersey?
- (2) Is there a nexus between NO_x emissions and ozone concerns?
- (3) Are there possible EPA alternatives to ozone standards?
- (4) What are the limitations on SCR technology with distillate oil used as alternative fuel capability?
- (5) What are the effects of load following through turndown and duct firing?
- (6) What are the cost impacts of SCR and project economics based upon variant avoided cost rates?
- (7) Will SCR preclude the ability to structure ultimate financing of projects?

The Coalition also understands that some interested parties have discussed the propriety of a size cutoff for imposition of a potential SCR requirement. The Coalition maintains there is no record evidence consistent with the statute or the regulations justifying SCR requirements for cogeneration facilities in excess of a certain size threshold. Such a finding would be arbitrary, capricious and not supported by any evidence before the DEP. If SCR cannot meet the relevant statutory tests, it is inappropriate and not required for any cogeneration facility no matter what the size within the State. Ignoring these requirements of the statutory and regulatory scheme is not acceptable and not supportable as a matter of law or policy within the State.

Finally, the DEP must maintain a prospective orientation if it does decide to proceed with an SCR determination as BACT, even in the face of these written comments and the lack of any

evidence to support such a determination. Any project currently on file with a DEP permit application must be grandfathered from any change in law or policy on SCR. Such a prospective orientation is only fair as a matter of law, equity, and policy and should be developed on the basis of a cutoff date determined as of the date the DEP provides formal notice and solicits written comments within the meaning of 40 C.F.R. §124.10.

Respectfully submitted,


Michael U. Zimmer
President

MJZ1/14

January 21, 1987

Henry T. Blekicki
Assistant Commissioner
STATE OF NEW JERSEY
DEPARTMENT OF COMMERCE AND ECONOMIC DEVELOPMENT
Division of Economic Planning and Conversation
101 Commerce Street
Newark, NJ 07102-5102

Dear Mr. Blekicki:

Energy Factors, Incorporated ("EFI"), a California corporation engaged in the business of developing, owning and operating alternative energy production facilities throughout the United States, currently has two cogeneration projects in an advanced stage of development in New Jersey. EF Union, Inc. ("EFUI"), a wholly-owned subsidiary of EFI, is developing a 7 megawatt facility at the site of the Schering Corporation plant in Union, New Jersey, and EF Kenilworth, Inc. ("EFI "), also a wholly-owned subsidiary of EFI, is developing a 25 megawatt net facility at the site of the Schering Corporation plant in Kenilworth, New Jersey. EFI has maintained an office in Iselin, New Jersey since early in 1986 to develop these and other East Coast projects. A construction contract has been signed with EBASCO Constructors, Inc. for the Kenilworth project and with TurboSystems, Inc. for the Union project.

To date, EFI and its subsidiaries have expended in excess of \$1 million in the development of the Kenilworth and Union projects in New Jersey, and are committed to the expenditure of at least \$40 million in the completion of these two facilities. The Kenilworth plant is projected to begin serving Schering and providing electricity sales to Jersey Central Power & Light Company ("JCP&L") by July, 1988, and the Union plant is anticipated to be on-line by December, 1987.

The critical path item facing each of these projects is the air permitting process, which is administered by the New Jersey Department of Environmental Protection ("NJDEP"). Financing of the projects and the beginning of on-site construction is dependent upon the issuance of air permits for each facility.

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Assistant Commissioner
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EFKI submitted its application for an air permit to the NJDEP on December 3, 1986. This application reflected the result of months of earlier meetings and discussions between the NJDEP, EFKI and EnviroSphere/EBASCO, EFKI's environmental consultant subcontractors. From the beginning of EFKI's planning for the Kenilworth facility, project design and engineering and project economics were based upon compliance with existing law. EF Union, prepared to submit its permit application this week and awaits the outcome of this Workshop.

EFI understands that consideration is now being given at the NJDEP to changing the existing rules to require the utilization of selective catalytic reduction ("SCR") in cogeneration projects to be constructed in New Jersey, and to suspending processing of air permit applications now pending before the NJDEP until a determination on SCR has been made. EFI wishes to set forth in brief its views on this proposed change and its potential impact on the Kenilworth and Union projects.

1. EFI believes that any decision by the NJDEP to require SCR for cogeneration facilities warrants further study by NJDEP and participation by affected members of the public through notice and comment or formal hearing proceedings. Criteria should be clearly established as to when SCR technology is to be required, if at all.

The application of SCR technology to cogeneration plants in the United States is in its infancy. There continues to be a significant amount of uncertainty regarding the efficacy and long-term reliability of this technology under the variety of applications to which it may be subject. As an example, the effectiveness of the catalyst used in the SCR process appears to deteriorate rapidly when oil is burned for an average of 30-60 days per year. Operation and Maintenance costs for SCR are uncertain, but are certainly higher by a significant amount. The additional annualized cost at Schering-Kenilworth is estimated at over \$1.2 million/year.

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The perceived uncertainties regarding SCR technology has generated concerns within the financial community to which many project developers must turn in order to fund construction of their projects. These concerns, which relate primarily to the effect of SCR on project performance and on-line reliability, will impair the development of cogeneration in New Jersey if lenders are unwilling to finance projects for which SCR is required. Only a fraction of those cogeneration projects currently under development can bear the cost of SCR.

2. Whatever the outcome of a reasoned and informed rulemaking regarding the adoption of an SCR standard, the application of the resulting rule should be prospective, and should not affect or delay projects under development for which applications have already been submitted to the NJDEP or for which significant expenditures have already been incurred.

Had the Kenilworth project been designed for SCR from the beginning, it is estimated that approximately \$1.2 million would have been added to the project cost, an increase which would severely adversely impact the project's economics. Were the project required at this time to include SCR, however, the add-on cost will be increased by over 50% to nearly \$1.9 million, because of the problem of redesign and retro-fitting to existing plans and procurement arrangements. The Project will almost certainly not proceed should SCR be mandated!

The delays which will result from the suspension of prompt processing of pending applications, or from a determination which would require the redesign and re-engineering of the projects to incorporate SCR technology, will also result in not meeting contract deadline dates for project construction and operation which were negotiated based on existing law and permit application processing lead-time projections.

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Assistant Commissioner
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Should the NJDEP determine that SCR technology is appropriate for cogeneration projects in New Jersey, that determination should apply prospectively, and not to projects already in the permitting stage. EFI has dealt in good faith with the NJDEP, has expended significant sums on the design and engineering of these projects in reliance upon the existing law with respect to environmental controls and the resulting project economics, has submitted an application for an air permit to the NJDEP, and awaits a prompt and favorable response.

For the NJDEP to suspend timely consideration of permit applications already submitted or to impose new and more stringent requirements of uncertain validity upon EFI would most certainly be unjust.

3. EFI has devoted substantial resources to the development of the Kenilworth and Union cogeneration projects in New Jersey. These projects hold the prospect of great benefits for the people of New Jersey and its economy, benefits which will be lost in the event that the actions of the NJDEP render these projects uneconomic.

Whether it is in the interest of the state to require that SCR technology be incorporated into projects which may be developed in the future remains to be determined. It does not, however, seem in the interest of New Jersey to lose existing projects under development which offer substantial tangible benefits to its citizens.

EFI appreciates the opportunity to submit these comments.

Sincerely,

Robert J. Kostal
Manager - Business Development

RJK/dlc
3024D

DATE: JANUARY 21, 1987

RE: NJ DCED/DEP SCR MEETING COMMENTS

Thank you for inviting Energy Factors to be a part of this meeting. For those of you who are not familiar with us, Energy Factors is a developer and owner of cogeneration and small power generation units throughout the U.S. We currently have 75 MW of capacity on line and over 300 MW under development.

Two of the facilities under development are in New Jersey with Schering Plough as the host company. These facilities are a 25 MW GE LM2500 turbine in Kenilworth and a 7 MW facility in Union using two Allison 501 KB5 turbines.

Energy Factors applauds the joint efforts by the Departments of Environmental Protection and Commerce and Economic Development in having this meeting to help establish reasonable regulatory procedures for cogeneration projects. These procedures will hopefully allow cogeneration benefits to support New Jersey's continued economic growth while continuing the environmental improvements we all seek and enjoy.

We welcome the opportunity to address the issues and have prepared a written statement for your review. We must say that there has been very little time between notification and this meeting, and your announcement referenced complex questions that are not quickly or easily answered. We are anxious to support our position and as we develop new information and thoughts through the use of our inhouse and outside expertise, we will supplement this submittal.

I would like to offer our comments on several of the key issues:

The first step in bringing one of our projects from conception to realization is the negotiation, usually simultaneously, of the key project contracts. These include:

1. Energy Services Agreement between developer and host.
2. Power Sales Agreement between developer and utility purchasing excess power.
3. Wheeling Agreement between developer and transmission utility.
4. Engineering, Procurement and Construction agreement between developer and turnkey contractor.

These contracts turn out to be a delicate economic balance, all based on the anticipated siting and regulatory requirements. Change these requirements after these contracts are established and the careful interwoven relationship of the contracts is destroyed, and very often the project as well. It becomes an unattractive investment for the developer and therefore the host.

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How does addition of SCR affect this process?

1. Capital cost - a significant increase in the EPC contract
2. Maintenance:
 - a. Catalyst replacement - a significant new operating cost directly reducing the developer/operator anticipated revenue stream.
 - b. Down time - effect not clear because of lack of SCR long term operating experience - expected to increase downtime also lowering revenue stream.
3. Perception of risk - a new worry to the financial investors.

The capital cost and expected catalyst replacement cost can be factored into the projected economics to see if the project is still attractive based on the rates negotiated in the Energy Service and Power Sales Agreement. Most smaller projects negotiated under current buy back rates will fail at this point.

However, assume for a moment the rates will support the capital cost and expected catalyst replacement cost. What new risks occur when the financial community looks at the project?

To finance a project, the investors look to long term proven technology and the carefully balanced contracts. These insure the project will survive until the debt is repaid.

Even if the project economics can absorb the cost of SCR, doubts arise over unanticipated downtime, more frequent than expected catalyst replacement, and the unproven long term operation of the system. This may prevent financing. Similarly, a position of perhaps requiring SCR at some future date destroys the predictability of the debt service, again stopping the project.

What of the early NJ projects that included SCR? These projects have buy back rates far in excess of the currently available rates and can more easily support SCR costs. Additionally, they are of a size requiring a PSD, and they opted for SCR to shorten the permitting process, thereby speeding up their revenue stream. Newer and smaller projects which do not require PSD's do not have the same incentives.

In the short term, cogeneration is displacing alternate generation from older, more polluting generating facilities. In the long run, cogeneration offsets the need for ^{new} large coal generating stations in New Jersey or neighboring states, and thereby offsets the environmental impacts from these plants.



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The rates for which cogenerators can sell their power are a reflection of available capacity and fuel charges. The high costs of SCR are not reflected in those rates. If a utility were required to add SCR, the public benefit would be paid for by increased rates thru an addition to the rate base. There are inequities here that need addressing.

Does the State benefit from cogeneration? The host companies enjoy lower electricity and thermal costs allowing them to be more competitive and successful. If SCR denies one of our corporate customers the use of cogeneration, we make his survival more difficult and his relocation more likely.

These are a few of the key issues. We believe this subject needs careful review and further study. We are willing to contribute to that effort so that reasonable procedures can be developed. We feel the risk to smaller projects is great and SCR should not be quickly or rashly established as our requirement. In the meantime, we believe committed projects should be allowed and encouraged to proceed under the regulatory environment current at the time of their commitment.

/jf

SUMMARY OF TESTIMONY REGARDING COSTS AND ENVIRONMENTAL
BENEFITS OF SCR DETERMINED FOR FOUR COGENERATION PROJECTS

Over the past several months Envirosphere has been actively involved in the air quality permitting of four (4) gas turbine cogeneration facilities in New Jersey. These facilities range in size from 25 to 97 MW and include the following types of turbines:

- o Brown Boveri Type 8
- o General Electric LM 2500
- o General Electric LM 5000
- o General Electric Frame 6

As part of these permitting efforts we have prepared air permit applications which included a State-of-the-Art Review (SOAR) for the control of NO_x emissions and a demonstration of compliance with ambient air quality standards. The SOAR examined the cost and feasibility/reliability of technologies capable of achieving NO_x emission rates of 42 ppm (water/steam injection) and 21 and 9 ppm (selective catalytic reduction (SCR)). The SOAR preparation also involved contact with air pollution control agencies in New York, Pennsylvania, Connecticut, Rhode Island and Massachusetts to determine the levels of NO_x emission considered Best Available Control Technology (BACT) in these states. Envirosphere also performed demonstrations of compliance of the facilities with Ambient Air Quality Standards based upon atmospheric dispersion modeling and an investigation of emissions of other nearby sources.

The ranges of NO_x emissions for the four facilities using the various types of control equipment investigated are shown below along with NO_x emissions of vehicular and major point sources in the counties containing the proposed sites, which is presented for comparative purposes.

Range of NO_x Emissions for
Four Facilities Investigated

<u>Control Method</u>	<u>NO_x Emission Rate</u>	
	<u>(PPM)*</u>	<u>Tons per year*</u>
Steam/Water Injection	42	160 - 700
Selective Catalytic Reduction	21	56 - 250
Selective Catalytic Reduction	9	35 - 140
County Wide Emissions (1)	-	43,000 - 55,000

The expected annual emissions from these facilities are relatively small when compared to major utility/industrial sources, but are clearly insignificant when compared to area wide NO_x emissions in each of the counties in which they would be located.

The annualized costs of SCR systems capable of achieving the emission rates shown ranged from \$1.1 to 3.5 million to reduce emissions from 42 to roughly 21 ppm, and an additional \$0.36 to 1.2 million to reduce emissions from 21 ppm to roughly 9 ppm. (Annualized costs include annualized capital costs plus annual operating and maintenance costs plus penalties due to loss of availability and power).

Our analysis of these four (4) facilities also included atmospheric dispersion modeling. The results of these studies are summarized below.

Range of Maximum
Predicted Nitrogen Dioxide Impacts

<u>Control Method</u>	<u>Emission Rate (ppm)*</u>	<u>Predicted Maximum Impact (u/gm³)*</u>
Steam/Water Injection	42	0.5 - 6.0
Selective Catalytic Reduction	21	0.2 - 2.1
Selective Catalytic Reduction	9	0.1 - 1.3

These predicted maximum impacts are only a small fraction of the National Ambient Air Quality Standard (NAAQS) for nitrogen dioxide of 100 ug/m³. Further, they are in many cases only a fraction of the EPA defined "significance level" of 1 ug/m³. (Concentrations below this value are considered to have an insignificant impact). In addition, the predicted impacts shown above were calculated at one or at most a few, closely spaced points in a receptor grid. The majority of the areas surrounding these facilities were predicted to have impacts far below these values.

By simple subtraction the reductions in maximum impacts accomplished by adding SCR to the facilities are as follows:

- o use of SCR to reduce emissions from 42 to approximately
21 ppm - 0.3-4 ug/m³
- o use of SCR to reduce emissions from 21 to approximately
9 ppm - 0.1 - 0.8 ug/m³

It is clear from the above that the use of SCR on the four projects we have permitted will result in a negligible reduction in ambient nitrogen dioxide impacts. It should also be noted that these reductions are associated with changes to maximum impacts in a very small area. Changes to the much smaller impacts predicted for the majority of the areas surrounding these facilities would be considerably smaller.

If the annualized costs associated with this equipment are normalized to a dollars per microgram per cubic meter basis we find that the annualized costs of SCR for these projects has ranged from \$0.8 to 11.9 million per microgram to go from 42 to 21 ppm of NO_x emission and an additional \$1.2 to 11.8 million per microgram to go from 21 ppm to 9 ppm. These costs are clearly excessive by any standard.

As part of our research into this subject we have contacted air pollution agencies in New York, Pennsylvania, Connecticut, Rhode Island and Massachusetts. The individuals who we spoke to at these agencies stated that none of them had current plans to require SCR as Best Available Control Technology on gas turbine facilities. Based on the environmental and cost data we have developed we feel that the NJDEP should also proceed more cautiously before adopting SCR for NO_x control on gas turbines.

(1) NJ State Implementation Plan (1981)

* These values are approximate (PPM) or have been subject to rounding (TPY, ug/m³)

SELECTIVE CATALYTIC REDUCTION (SCR)

PRESENTATION DOCUMENTATION

1. Introduction

Ebasco Services Incorporated (ESI) presentation included considerations concerning cost and engineering data related to Selective Catalytic Reduction (SCR) at the Workshop on SCR Control Technology and Cogeneration Facilities, dated January 22, 1987.

The presentation responded to several of the questions posed by the New Jersey Department of Environmental Protection (DEP) and New Jersey Department of Commerce and Economic Development in their invitational letter:

The DATA and INFORMATION given in the presentation was primarily generic, and not vendor specific. The information was based on published facts and in-house data related to SCR cost, emissions, problems associated with SCR, and initial operating experience of a cogeneration plant built by Ebasco. Our conclusions revealed that SCR is not state of the art as of this date because of limited operational experience and extremely high costs in comparison to resulting emission reduction.

II. Review of Presentation, and Supporting Documentation - Copies of Slides are attached in Appendix I

A. NO_x Emissions Summary (Slides 1 and 2)

These slides demonstrate that water injection into an LM2500 gas turbine eliminates 75% of the uncontrolled NO_x emission. Uninjected, 149.9 lbs/hr of NO_x is formed; with water injection, 36.85 lbs/hr is formed; using SCR to a lowest level of 9 ppm, 7.9 lbs/hr will be emitted to atmosphere. The emissions data is traceable to test programs performed by General Electric Company. With water injection, the NO_x control cost is 21¢ per pound per year (levelized); the additional removal with SCR will cost \$5.33 per pound (levelized), or 25 times the water injection cost. The cost data is traceable to the SOAR analysis performed for the Energy Factors Kenilworth cogeneration project currently under development for Schering-Plough Corporation in New Jersey. The components of the high annual costs for installing an SCR system include a high capital cost investment, loss of performance efficiency due to high pressure drops across the SCR, a loss of plant availability, and operations and maintenance charges.

B. Summary of SCR Costs (Slide 3)

This slide presents a summary of the costs incurred when installing and operating an SCR system. All costs are quantitative and traceable to vendor quotations, or engineering calculations. The additional availability loss of 3% is an engineering judgment because

sufficient statistical data does not exist. This value of 3% derating of availability guarantees when SCR is employed by mandate has been quoted by major equipment suppliers to Ebasco for gas turbine based cogeneration plants.

The basis for these assumptions include potential catalyst failure, corrosion and fouling of downstream boiler equipment due to ammonium - sulfur compounds, water washing requirements to remove tube deposits, instrumentation problems, and minor equipment failure.

C. Necessary Utility Operating Regimens Excluded due to Inclusion of SCR
(Slide 4)

The information on this slide illustrates limitations imposed on five modes of plant operation when SCR is required.

1. Temperature Limitations, Variable Pressure Operation

SCR specification tolerances, most notably the temperature range of the SCR, particularly with sulfur in the exhaust, prevents operating the plant to accept high supplementary firing temperatures (to 1600°F) during peak steam demand, and variable pressure - part load operation during electric curtailment periods. Heat balances for an LM2500 plant indicate that temperatures following the superheater when firing the HRSG to 1600°F can be as high as 1400°F, much too high for SCR operation; therefore, the evaporator must be split to place the SCR in an 800°F zone. However, when at a part load variable-

pressure condition on a cold winter day, when gas turbine exhaust temperature is low, the SCR zone will be at 520°F, which is too low for SCR. The temperature swings in the SCR zone are severe.

The effect of temperature on SCR degradation and poor performance, as well as the detrimental effect of sulfur bearing fuels, is stated in numerous references:

- a. "Deposition of Ammonium Bisulfate in the Selective Catalytic Reduction of Nitrogen Oxides with Ammonia", by Matsuda, Kamo, Kato, Nakajima, p. 51, Industrial and Engineering Chemistry - Product Research & Development, March 1982, Vol. 21, 1.

This article presents research data which demonstrates that catalyst efficiency is reduced to values as low as 0%. This reduction is a function of SO_3 quantity and in flue gas temperature.

2. Oil Firing Limitations

The firing of oil is limited due to formation of SO_3 compounds, which cause production of corrosive ammonium sulfates. References include:

- a. "Status of NO_x Removal from Combustion Gases", by A. V. Slack, p. 7, I. Chem. E. Symposium Series No. 57, 1979.

This article discusses ammonium bisulfate deposition, and indicates that high concentrations of SO_3 may be formed locally at the catalyst surface.

- b. Chapter 9, Handbook of Air Pollution Technology - 1984.

Further discussion concerning ammonium bisulfate deposition and its corrosive effects, is given.

- c. Nitrogen Oxides Control and Removal, by Noyes, 1979.

The problem of formation and precipitation of ammonium bisulfate (NH_4HSO_4) is discussed.

- d. Using SCR for NOx control affects HRSG design, operation, by J. S. Davis, G. C. Dupontell, Power Magazine, October 1986, p. 60.

This article mentions problems associated with ammonium sulfate production which forms when SO_3 is present.

3. Part Load Performance

Operation at part loads reduces the gas turbine exhaust temperatures, and SCR zone temperatures. The effects of low temperatures are discussed in several of the aforementioned references.

4. Bypass Stack

The bypass stack is located upstream of the HRSG and SCR unit. If a unit is mandated with an SCR system, operation in this essential sample cycle mode in emergency situations or steam cycle failure becomes impossible.

In view of all the documented SCR problems, it has been concluded that SCR places constraints on some necessary plant operating modes; therefore it is strongly recommended to avoid installation of SCR until vendors will be able to specify systems which exclude limitation of boiler zone temperatures, plant loads, and oil firing periods.

D. Offsets From Existing or New Power Plants (Slides 5,6,7)

These slides present the calculations which support the conclusion that NOX emissions from a combined cycle plant operating with water (or steam) injection to 42 ppm are less than either existing or new conventional facilities which provide the same electrical and thermal output.

A simple conclusion follows: Mandating SCR may cause cogeneration project cancellations; as a result NOX emissions in New Jersey will be higher than they would have been without the SCR mandate at the same level of energy production. Therefore, water injected gas turbines are a solution to the NOX emission problem.

E. Miscellaneous Facts and Causes of Concern (Slide 8)

- A. The very real concern of catalyst supply reliability is addressed in this slide. The catalysts contain precious metals, mainly of imported origin, and due to the law of supply and demand, possibly subject to large price increases if demand is suddenly and rapidly increased due to SCR mandate.
- B. The DEP asked if catalysts can be removed during oil use. Oil can be fired when gas supply is interrupted, or when a gas compressor fails. There can be many changeovers from gas to oil in a year including sudden unplanned changeovers. The SCR large panel size makes impractical regular removal of this equipment. Further, if ammonia is not injected during periods of oil use, NOX emissions will stay at a level corresponding to water or steam injection. The SCR therefore serves no purpose. In view of permit requests for 3,000 hours on oil fuel, it becomes even more expensive and less justified to require the SCR for only gas firing periods.

F. SCR Experiences at United Air Lines (UAL) (1st Year of Operation)
(Slide 9)

The manufacturer of the SCR equipment has recently requested that ESI make no more public comments regarding the first year of SCR operational experience at UAL, because the plant operated at low load and oil fuel only. ESI will comply with this request and not

reiterate the content of this slide. ESI comments at the presentation were intended to answer questions posed by the DEP and Department of Commerce, and not fault the manufacturer, or plant operations. These comments were made to highlight the point that design constraints are made on a gas turbine cogeneration plant that would not have to be made without the SCR. Issues as to the fault for any problems which have occurred with SCR, whether the operators, designers, or manufacturers, are totally irrelevant. The problems occur due to design constraints that are too rigid.

SUMMARY AND CONCLUSIONS

The summary and conclusions of the presentation are reproduced, as follows:

- o SCR operating experience with gas turbine/heat recovery boilers is very limited and cannot be considered proven and reliable.
- o SCR removes 1/4 the amount of NOX pollutants at 25 times the cost compared to water injection.
- o An offset analysis, whether compared to generation reductions of existing facilities, or capacity increases of building new facilities, reveals that gas turbine combined cycle NOX emissions with water injection are less than conventional plants which equal or exceed the requirements of 40 CFR60 "Federal Standards of Performance for New Stationary Sources of Air Pollution."
- o Use of SCR prevents operation at 5 critical modes required of a utility grade plant.
- o Cogeneration plants will experience loss of availability with SCR.
- o Capital and annual costs of SCR are extremely high, and may cause cancellation of viable cogenerating projects.

LM 2500 COMBINED CYCLE COGENERATION PLANT

GAS FUEL

NOX EMISSIONS

<u>NO WATER INJECTION</u>	<u>WITH WATER INJECTION</u>	<u>WITH SCR</u>	<u>LEVELIZED ANNUAL COST OF NOX REMOVAL</u>
171 PPMV	42 PPMV	9 PPMV	
.6 LBS/10 ⁶ BTU	.15 LBS/10 ⁶ BTU		
149.9 LBS/HR	36.85 LBS/HR		\$ 0.21/LB

$$\Delta = 113.05 \text{ LBS/HR}$$

$$36.85 \text{ LBS/HR} \quad .03 \text{ LBS/10}^6 \text{ BTU} \quad \$5.33/\text{LB}$$

$$7.9 \text{ LBS/HR}$$

$$\Delta = 28.95 \text{ LBS/HR}$$

NOX REMOVAL WITH SCR IS 25 TIMES THE COST OF WATER INJECTION
ON A UNIT BASIS

SCR REMOVES 1/4 THE QUANTITY OF NOX WHEN COMPARED TO WATER INJECTION

COMPONENTS OF HIGH ANNUAL COSTS FOR SCR

- HIGH FIXED COSTS DUE TO EXPENSIVE CAPITAL INVESTMENT
- LOSS OF PERFORMANCE DUE TO HIGH PRESSURE DROPS ACROSS SCR
- LOSS OF PLANT AVAILABILITY
- OPERATIONS AND MAINTENANCE CHARGES

SUMMARY OF SCR COSTS
25 MW LM2500 COMBINED CYCLE COGENERATION PLANT

1. CAPITAL INVESTMENT

A. COST OF SCR + INSTALLATION	\$ 1,206,000
B. PLANT ENGINEERING	
C. COMMISSIONING AND TESTING	70,000
D. INCREASED BUILDING COST, MAINTENANCE HOIST	

2. ANNUAL 1ST YEAR COST

A. PERFORMANCE LOSS, 4IN W.C. PRESSURE DROP 155KW	82,000
B. AVAILABILITY REDUCTION DUE TO AMMONIUM SULFUR COMPOUNDS DEPOSITION ON TUBING, AND OTHER PROBLEMS 263 HOURS YEAR (3%)	261,000
C. OPERATIONS AND MAINTENANCE	
A. AMMONIA FOR NO _x EMISSION LEVEL OF	56,000
B. CATALYST REPLACEMENT (2 YEAR INTERVALS)	150,000
C. MANPOWER	20,000
D. INSTRUMENTATION, CALIBRATION, TROUBLE- SHOOTING TUBE WASH	60,000
E. <i>FIXED CHARGES</i> 83X	150,000

NECESSARY UTILITY OPERATING REGIMENS
EXCLUDED DUE TO INCLUSION OF SCR

1. DUCT BURNING TO TEMPERATURES WHICH CAUSE EXCESSIVE
CATALYST TEMPERATURES
(CATALYST WILL BE DESTROYED)
2. OIL FIRING AT BASE LOAD FOR EXTENSIVE PERIODS
(VENDOR RESTRICTION AT UAL SITE)
3. PART LOAD GAS TURBINE OPERATION WHEN FIRING OIL
(CATALYST WILL BE DESTROYED)
4. STEAM GENERATOR BYPASS STACK (NECESSARY INDEPENDENT
OPERATION OF GAS TURBINE AND STEAM SYSTEM)
5. *VARIABLE PRESSURE OPERATION*

OFFSET EFFECT ON NOX EMISSIONS -

COMPARISON TO OPERATING GAS FIRED BOILERS WHICH ARE IN COMPLIANCE WITH
40 CFR 60 "FEDERAL STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES OF AIR POLLUTION"

25 MW AND 40,000 LBS/HR COMBINED
CYCLE EMISSIONS W/WATER INJECTION
ONLY TO 42 PPMV

EXISTING INDUSTRIAL BOILERS
WHICH PRODUCED 40,000 LBS/HR
AT 75% EFFICIENCY

EXISTING UTILITY CENTRAL
STATION BOILER-TURBINE
PLANT REDUCING OUTPUT BY
25 MW AT 10,750 BTU/KWH NET
REGIONAL
NOX
IMPROVEMENT

36.85 LBS/HR

10.67 LBS/HR

53.75 LBS/HR

27.57 LBS/HR

.15 LB/10⁶ BTU

.20 LBS/10⁶ BTU

.20 LBS/10⁶ BTU

NOX IS EXPRESSED AS NO₂

858

OFFSET EFFECT ON NOX EMISSIONS

COMPARISON TO NEW BOILER AND GENERATING PLANTS,
DESIGNED TO LEVELS EXCEEDING 40 CFR60 REQUIREMENTS
GAS FIRING

25 MW AND 40,000 LBS/HR
COMBINED CYCLE
EMISSIONS WITH WATER
INJECTION ONLY TO 42 PPMV

NEW INDUSTRIAL
BOILERS, PRODUCING
40,000 LBS/HR AT
80% EFFICIENCY

NEW UTILITY
STEAM PLANT
PRODUCING 25 MW
AT 10,500 BTU/KWH

NET REGIONAL
NOX
IMPROVEMENT

36.85 LBS/HR

5.0 LBS/HR

32.81 LBS/HR

0.96 LBS/HR

.15 LB/10⁶ BTU

.10 LBS/10⁶ BTU

.125 LBS/10⁶ BTU

298
X

OFFSET EFFECT ON NOX EMISSIONS
COMPARISON TO NEW COAL FIRED BOILER AND EXISTING GAS
INDUSTRIAL BOILER, WHICH ARE IN COMPLIANCE WITH
40 CFR60

25 MW AND 40,000 LBS/HR
 COMBINED CYCLE EMISSIONS
 WITH WATER INJECTION
ONLY TO 42 PPMV

EXISTING INDUSTRIAL BOILERS
 PRODUCING 40,000 LBS/HR
AT 75% EFFICIENCY

NEW UTILITY
 COAL FIRED STEAM PLANT
 PRODUCING
25 MW AT 10,750 BTU/KWH

NET
 REGIONAL
 NOX
IMPROVEMENT

36.85 LBS/HR

10.67 LBS/HR

161.30 LBS/HR

135.12 LBS/HR

.15 LB/10⁶ BTU

.20 LBS/10⁶ BTU

.60 LBS/10⁶ BTU

NOTE: NO SO₂ EMISSIONS ARE PRODUCED
 NOX IS EXPRESSED AS NO₂

PARTICULATE AND SO₂ EMISSIONS
 WILL OCCUR

878
 X/LB

SCR - MISCELLANEOUS FACTS AND CAUSES OF CONCERN

1. WILL THERE BE A RELIABLE SUPPLY OF PRECIOUS METALS FOR CATALYST PREPARATION?
2. COSTS OF FUTURE CATALYSTS, IF A LIMITED PREVIOUS METAL RESOURCE MUST BE STRETCHED TO SUPPLY MANY CATALYSTS, ARE UNCERTAIN.
3. SIZE OF SCR PANELS
AT UAL, 10 PANELS, EACH WEIGHTING 3,000 LBS AND MEASURING 10' X 11' X 1' CONTROL NOX FROM 42 PPM TO 9 PPM. REMOVING PANELS OF THIS SIZE WHEN FIRING OIL IS IMPRACTICAL.
4. POTENTIAL PROJECT CANCELLATION WITH SCR REQUIREMENT FOR ECONOMIC REASONS.

SCR PROBLEMS AT UNITED AIR LINES

(1 YEAR OF OPERATION)

1. CATALYST FOULING AND REPLACEMENT.
2. SPORADIC AND UNRELIABLE PERFORMANCE (ABILITY TO REDUCE NOX DEGRADES). UNIT IS CURRENTLY INOPERABLE.
3. CONTINUAL INSTRUMENTATION PROBLEMS AND RECALIBRATION OF SPAN GASES.
4. TUBE EXTERIOR FOULING WITH CORROSIVE FERRIC AMMONIUM SULFATE, REQUIRING SHUTDOWN AND LENGTHY TUBE CLEANING BY WATER WASH.
5. RESTRICTIONS ON OIL FIRING TO 500 HOURS PER YEAR, AND NO PART LOAD OPERATION.
6. SERVICES OF A HIGHLY SKILLED TECHNICIAN ARE REQUIRED TO OPERATE THE SCR UNIT.
7. DEPOSITS ON THE BOILER BOTTOM, BELIEVED TO BE A COMPOUND CONTAINING THE CATALYST MATERIAL, HAS BEEN SENT TO VENDOR FOR ANALYSIS.

SUMMARY AND CONCLUSIONS

- SCR REMOVES 1/4 THE NOX POLLUTANTS AT 25 TIMES THE COST COMPARED TO WATER INJECTION.
- AN OFFSET ANALYSIS, WHETHER COMPARED TO GENERATION REDUCTIONS OF EXISTING FACILITIES, OR CAPACITY INCREASES OF BUILDING NEW FACILITIES, REVEALS THAT GAS TURBINE COMBINED CYCLE NOX EMISSIONS WITH WATER INJECTION ARE LESS THAN CONVENTIONAL PLANTS WHICH EQUAL OR EXCEED THE REQUIREMENTS OF 40 CFR60 "FEDERAL STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES OF AIR POLLUTION."
- USE OF SCR PREVENTS OPERATION AT 4 CRITICAL MODES REQUIRED OF A UTILITY GRADE PLANT.
- ANNUAL COSTS OF SCR ARE EXTREMELY HIGH, AND SEVERELY ERODE THE RETURN ON INVESTMENT FROM COGENERATION PROJECT.
- ONE YEAR OF OPERATING EXPERIENCE AT THE EBASCO BUILT UNITED AIR LINES PLANT REVEALS VARIOUS PERFORMANCE PROBLEMS OF THE SCR MODULE.
- COGENERATION PLANTS WILL EXPERIENCE LOSS OF AVAILABILITY WITH SCR.
- A VERY POSSIBLE CANCELLATION OF VIABLE COGENERATING PROJECTS CAN RESULT WITH AN SCR MANDATE

SUMMARY OF RECENT INFORMATION
REGARDING THE EAST COAST OZONE
ATTAINMENT STRATEGY

Based on information regarding indirect NO₂ impacts on ambient air quality due to NO_x emissions from cogeneration facilities, and comments from NJDEP and other representatives at the October 22nd hearing on the NO_x control issue, it is our impression that the NJDEP is focusing on the ozone nonattainment problem as the rationale for reducing NO_x emissions. It appears as though NO_x is being considered an ozone precursor of the same importance as volatile organic substances. The following comments are offered on this matter:

- 1) The Northeast States for Coordinated Air Use Management is studying a phase in of a regional cap on the Reid vapor pressure of gasoline which is considered to be the only short term control measure available for ozone reduction. This regional cap is considered to be a more cost effective measure than stage II at-the-pump controls (Inside EPA - January 2, 1987).
- 2) EPA is considering a national volatility standard because the higher vapor pressure of gasoline in the marketplace is causing evaporative emissions that are the prime cause of ozone pollutions (Inside EPA September 27, 1985).
- 3) A recent modeling study, (Oxidant Modeling in the New York Metropolitan Area Project), has indicated that the NY Metropolitan Area is not likely to attain compliance with respect to ozone levels without a regional approach to the problem. Due to the fact that the Northeast Corridor is thought to be a contiguous air basin, the control of precursors in New Jersey may not achieve the desired reduction in ozone levels within the state due to the significant transport of ozone and ozone precursors into the state.

The above information suggests that the control of small NO_x sources is not universally felt to be an effective approach to resolving the ozone non-attainment problem on the east coast.

envirosphere company

A Division of EBASCO SERVICES INCORPORATED

180 Chubb Avenue, Lyndhurst, NJ 07071 (201) 460-8500

K. L. KINKELA

OCT 15 1986

October 14, 1986

#165-86

Mr Thomas Micali
NJ Department of Environmental Protection
Bureau of Air Pollution Control - Rm 1110
Labor and Industry Building
John Fitch Plaza
Trenton, NJ 08625

RE: ENERGY FACTORS -
KENILWORTH COGENERATION PLANT
MINUTES OF OCTOBER 3RD MEETING

Dear Mr Micali:

Attached is a summary of important items discussed during the October 3rd meeting on the above referenced project with you and Dr Janowski. If any comments or questions arise on these items, please contact me at 201-460-6498.

Very truly yours,

Frederick B Pope III

Frederick B Pope III
Supervising Scientist

FBP:mk

cc: ~~K. L. Kinkela~~ - EBASCO
J Koerber - EF
T Janowski - NJDEP

CC J WARREN
3 COPIES TO KLIK
PROJECT FILES

MINUTES OF MEETING ON OCTOBER 3RD
AT THE NJDEP OFFICE IN TRENTON

Attendees

T Micali - NJDEP
T Janowski - NJDEP
F B Pope - Ebasco
S Eber - Ebasco
R Kostal - Energy Factors
J Korber - Energy Factors
T Weil - Energy Factors

Items of importance that were discussed during the meeting included:

- the ownership and operation of the proposed cogeneration plant should be clearly spelled out in the application to distinguish this facility from the existing facility at Schering. The source is not subject to PSD regulations;
- the permit application should not address emissions from the existing Schering boiler that will be utilized only under peak conditions;
- the nonmethane and methane hydrocarbons should be distinguished in the hydrocarbon emissions;
- the modelling of concentrations should start at the Schering property line. (This ruling was changed to the leased property line by T Janowski in an October 6 phone conversation);
- the ISCLT model should be used along with joint frequency data from Newark airport to estimate annual impacts;
- the background pollutant levels should be selected as the highest value measured over the last 3 years at proximate stations;
- the noncriteria pollutant impacts should be presented in the permit application;
- the air quality modelling should be performed for pollutant emissions in excess of 50 TPY;
- the building configurations at Schering should be presented as supporting information in the use of the ISC model in the down wash mode;
- the State of Art Review (SOAR) in Subchapter 8.4b (the demonstrated advances in air pollution control) requires that the use of selective catalytic reduction for NOx control only be examined for applicability based on cost. If the cost of controlling NOx emissions is the range of \$2-4/lb of NOx removed, the DEP will require the use of SCR. In computing the cost of SCR, O & M costs, penalties in performance and energy cost escalation over a 15 year lifetime, in addition to equipment cost at a reasonable fixed charge rate are allowed among other reasonable considerations.

- SOAR review for CO and HC removal need not be considered for this plant;
and
- the NJDEP currently requires a 90 day review period for the approval
of non-PSD permits starting from the time of submittal.

EBASCO SERVICES INCORPORATED**EBASCO**

180 Chubb Avenue, Lyndhurst, NJ 07071 (201) 460-1800

October 30, 1986
#174-86

Mr Thomas A Micai
NJ Department of Environmental Protection
Bureau of Air Pollution Control - 2nd Floor
401 E State Street
Trenton, New Jersey 08623

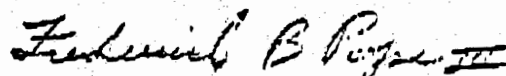
Re: ENERGY FACTORS - KENILWORTH COGENERATION
PLANT - PRELIMINARY MODELLING FOR
BUILDING DOWNWASH CONDITIONS

Dear Mr Micai:

As per our agreement at an October 3rd meeting in your office, I am forwarding preliminary modelling results for the proposed cogeneration facility. The request for this modelling demonstration was made by Dr T Juchnowski at the meeting such that the modelling procedures could be reviewed by the Agency prior to the submittal of an application for a permit. The information presented in this transmittal should be reviewed along with the analysis for building cavity impacts submitted for review on October 13, 1986.

As per my phone conversation with Dr Juchnowski, I anticipate discussing these procedures and results with the NJDEP during the week of November 3rd. Thank you for your consideration in this matter.

Very truly yours,



Frederick B Pope III
Supervising Scientist

FBP:mk

cc: T Juchnowski - NJDEP
T Main - EnviroSphere
File

envirosphere company

CC F POPE
J KOERBER
S PICCO

Interoffice Correspondence

DATE November 10, 1986 FILE REF. #182-86

TO K Kinkala OFFICE LOCATION Clay Ave.

FROM F B Pope *FBP* OFFICE LOCATION

SUBJECT ENERGY FACTORS - KENILWORTH COGENERATION
PLANT - AIR QUALITY EVALUATION

On October 13th and 30th I sent correspondence to the NJ Department of Environmental Protection regarding the results of preliminary calculations for building cavity effects at the leased property line and for preliminary modelling estimates under building downwash conditions. Comments on our calculations and modelling were made by Mr J Rees of the NJDEP in a phone conversation on November 6th. Items of importance discussed by Mr Rees in this conversation include the following:

- 1) Despite the fact that sulfur dioxide emissions will be below 50 TPY, an evaluation of this pollutant will be required;
- 2) The cavity calculations should be examined at the leeward-downwind side of the Schering buildings as well;
- 3) Cavity impacts should not be extrapolated to annual impacts. Only downwash computer modelling (ISCLT) should be used to estimate annual concentrations;
- 4) A one hour guideline for nitrogen dioxide impacts of 480 $\mu\text{g}/\text{m}^3$ should be addressed;
- 5) The agency cannot determine at this time if sequential (hour by hour) modelling is required;
- 6) If the Elizabeth Lab monitor is not considered a suitable indication of background NO_2 levels for this project, then more details regarding this determination should be given; and
- 7) Calculations that show the limited influence of the proposed gas turbine building on the release from the 50 ft stack should be provided.

TO: S. PICCO

SENT PER REQUEST OF
J KOERBER*KL Kinkala*
ERASE

96X

K Kilkela

-2-

November 10, 1986

Item 1 represents a change in the policy established at the protocol meeting on October 3rd. Items 2 and 7 are not a concern based on our evaluation. Item 5 involving a decision by the DEP after the application submittal has the potential to cause a 10 day additional work effort.

Envirosphere is currently working on the project and anticipates submitting the permit application and supporting demonstrations to the agency by December 5th.

FBP:mk

cc: A Letizia
T Main
D Hackel
File



December 3, 1986

Mr Thomas A Micai
New Jersey Department of Environmental Protection
Bureau of Air Pollution Control
401 E State Street - 2nd Floor
Trenton, NJ 08625

RE: EF KENILWORTH, INC.
KENILWORTH COGENERATION PLANT
APPLICATION FOR PERMIT TO CONSTRUCT
AND OPERATE NEW EQUIPMENT

Dear Mr Micai:

Please find enclosed the air permit application and supporting information required by the NJ Department of Environmental Protection for the proposed Kenilworth Cogeneration Plant. The information requests and evaluation procedures for this air contamination source were developed at an October 3rd meeting in your office, and were modified to comply with the subsequent requests made in phone conversations by Messrs Juchnowski and Rees.

Please note that pollutant concentrations have been estimated at the EFKI leased property line within the Schering property as per your instructions, despite the fact there is no separate property ownership and that there exists total control of public access within the Schering complex. The secondary 24 hour standard for sulfur dioxide (260 ug/m^3) has been used to demonstrate compliance with standards even though the application of welfare concerns are questionable in an industrial environment (and the secondary SO_2 standard has been dropped by the US Environmental Protection Agency). In addition we have investigated impacts caused by sulfur dioxide emissions even though the emission rate is less than 50 TPY, and the emission of sulfur dioxide is only associated with limited conditions of oil firing (up to 1600 hours per year).

This submittal is composed of three separate attachments, as follows:

- o Attachment A - Application for Permit to Construct and Operate Equipment (for the cogeneration plant and a 175,000 gal. oil storage tank);
- o Attachment B - Air Quality Evaluation; and
- o Attachment C - State of Art Review for Pollution Control

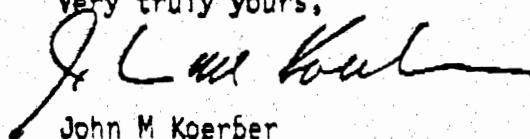
Enclosed is a check for \$1,000.00 which covers the Base Fee of \$250.00 for the cogeneration plant source and the oil storage tank source, and the Modeling Analysis Evaluation fee of \$500.00 for the cogeneration plant source.

REC'D DEC 9 1986

Mr Thomas A Micai
Page 2
December 3, 1986

EF Kenilworth, Inc. requests that a meeting be scheduled as soon as the NJ DEP has completed the initial review of this submittal to ascertain any additional concerns. Please contact Mr Frederick Pope of Ebasco Services Incorporated (201-460-6498) to arrange this meeting and to answer any questions concerning the submittal. Thank you for your consideration to this matter.

Very truly yours,



John M Koerber
Project Manager

JMK:BJP

envirosphere company

A Division of EBASCO SERVICES INCORPORATED

160 Chubb Avenue, Lyndhurst, NJ 07071 • (201) 460-6500



January 12, 1987
EFKI-PM-166
No. 3-87

Mr. John M. Koerber
EF Kenilworth, Inc.
401 "B" Street
Suite 1000
San Diego, CA 92101-4219

SUBJECT: EF KENILWORTH, INC.
KENILWORTH COGENERATION FACILITY
STATUS OF AIR QUALITY PERMIT APPLICATION

Dear Mr. Koerber:

As you are aware, Ebasco sent the air quality permit application and supporting information to the New Jersey Department of Environmental Protection on December 3, 1986. On December 4, I contacted Mr. T. Micali of the NJDEP, and he acknowledged receipt of the application and the corresponding correct payment of the application fee. Prior to the holidays (December 17 or 18), I contacted Mr. Micali concerning the schedule for the NJDEP review. At that time, he indicated that no progress had been made in the review of the permit application for the Kenilworth cogeneration facility and that the review would likely be initiated during the week of January 5, 1987. When I specifically inquired as to the possibility of a meeting on the 14th or 15th of January to discuss the NJDEP findings, Mr. Micali indicated that this meeting date was reasonable.

On January 6, I again contacted Mr. Micali for the purpose of scheduling a meeting to discuss the results of the NJDEP review of the application. Mr. Micali indicated that he would get back to me; the next day he informed me that John Davis, a member of his section was leading the review on this project. In a conversation on January 7, Mr. Davis stated that no progress has been made in the review of the EFKI submittal on December 4, and that he would not supply a date for the intended meeting. Mr. Davis is aware that I will be contacting him next week to determine the status of the agency's review.

Very truly yours,

Frederick B. Pope III
Supervising Scientist

cc: K. Kinkela
S. Eber

REC'D JAN 19 1987

100X

EF UNION, INC. COGENERATION PROJECT
CHRONOLOGY OF CONTRACTS AND PERMITS

<u>Date</u>	<u>Activity</u>
05/20/86	Sign Power Purchase Agreement with JCPL
06/20/87	Initiate interconnect study with PSE&G
06/24/86	Sign Site Lease with Schering
06/24/86	Sign Energy Services Agreement with Schering
06/26/86	Sign Turnkey Contract with Turbosystems
10/86	Turbosystems/Energy Services project design and environmental review
12/09/86	Meeting in Trenton with Tom Micai to discuss air quality permit application protocol, summary of meeting contained in memo of 12/19/86 from John Koerber (EFI) (copy attached)
02/06/87	Anticipate submittal of Air Quality Permit to NJDEP
03/87	Anticipate zoning approval



To: * Distribution

December 19, 1986

From: J. M. Koerber *JMK*

Subj: NEW JERSEY AIR QUALITY PERMITS

The attached memo from Tom Weil refers to an article from Cogeneration Report (December 5, 1986) concerning the NJDEP's position on the use of SCR for New Jersey cogeneration projects. Some of the quotes in the article from Tom Mical are very disturbing to me because I had met with Tom Mical on December 9, 1986 to discuss the permit protocol for our Schering Union project and left with a different understanding. Below is a summary of important points of that meeting:

1. Larger plants (greater than approximately 30 MW) will probably be required to use SCR in the future. Most larger plant permit applications are now coming in with SCR incorporated in order to avoid PSD review (triggered by 250 tons per year of any pollutant), a process taking at least one year. The article quoted Tom Mical to have indicated that 10 MW was the cutoff point for SCR.

2. NO_x reduction to 42 ppm at 15 percent O₂ is required for smaller plants (under approximately 30 MW). The Allison 501 and LM2500 can achieve this with water injection. The article quoted Tom Mical to say 21 ppm.

3. All pollutants must be modeled if any pollutant is above 50 tons per year. Modeling lengthens the permit application and review period approximately 30 days.

4. The permit process is now requiring 90 days to process if very simple, 120 days if modeling is required, and one year if PSD. Only PSD permit applications require formal notification by the NJDEP of application acceptance and only PSD applications have permit application process time limits in New Jersey.

5. No continuous monitoring is required.

6. Emissions must be verified and demonstrated in a test within 90 days of start-up.

7. The SOAR review criteria of \$2-4/lb of NO_x removal may be raised in the near future (must use the technology if costs are within this range). Estimated cost of SCR for an LM2500 combined cycle plant is over \$5/lb of NO_x removal.

* Distribution:R. J. Neary
J. R. CarlsonR. J. Kostal
J. H. WilliamsD. Dahl
S. J. Picco

T. E. Weil

Kidder, Peabody & Co.

Incorporated

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10 HANOVER SQUARE
NEW YORK, N. Y. 10005

January 30, 1987

Mr. Henry T. Bleicki
Assistant Commissioner
STATE OF NEW JERSEY
DEPARTMENT OF COMMERCE & ECONOMIC DEVELOPMENT
Division of Economic Planning and Conversion
101 Commerce Street
Newark, NJ 07102-5102

Dear Mr. Bleicki:

Energy Factors, Incorporated (EFI), a California corporation engaged in the business of developing, owning and operating alternative energy production facilities throughout the United States, is currently developing two cogeneration projects in New Jersey. EFI has retained our firm, Kidder, Peabody & Co., Incorporated to arrange the debt financing of these projects, one project is a 7 megawatt facility at the site of the Schering Corporation plant in Union, New Jersey; the other is a net 25 megawatt facility at the site of the Schering Corporation in Kenilworth, New Jersey. EFI has requested that we share with you our thoughts regarding the effect that the imposition of a requirement for Selective Catalytic Reduction (SCR) would have on the financing of these projects.

As you may recall, our firm acted as financial advisor and placement agent for the Bayonne Cogeneration Project, which did elect to employ SCR technology. However, that decision reflected project-specific considerations which do not apply to the Schering projects. In particular, the contracted revenue stream for Bayonne was significantly higher per dollar of capital cost and unit of energy output than it is for the Schering projects. Moreover, the Bayonne project will enjoy upfront federal tax benefits which will be unavailable to the Schering projects. In effect, the Bayonne project could afford to pay for SCR and was willing to do so rather than suffer extensive delay while air quality issues were being resolved. The Schering projects, with lower contracted revenue streams and a less favorable federal tax regime, do not have the same financial tolerance to bear the costs of SCR.

To explain this concept further, we should note that cogeneration projects are very often "project financed", which means that the project itself must economically support any debt that is raised and also provide an adequate return on the equity invested. In such projects, therefore, the capital cost of the

Mr. Henry T. Bleicki
Assistant Commissioner
Dept. of Commerce and Economic Development
January 30, 1987

asset and the ability of the asset to produce required revenues become critically important to the financing since investors have only the asset and its productive capabilities to look to for their return from a project.

Institutional lenders generally retain an engineering firm to evaluate the technical aspects of a project. Specifically with respect to SCR, an engineering study would evaluate the capital and operating cost impact and the effect that such technology may have on the productive capability (output of the cogeneration facility) and reliability of the facility. To the extent that SCR technology increases either or both the capital and operating cost and/or lowers the output of the facility, the project's economics would have to be adjusted in order to permit a lender to maintain a satisfactory margin between the cash flow which the project generates and the cash flow required to secure its loan.

EFI has informed us that the addition of SCR technology to the facility will materially increase both the capital cost of the facility and its annual operating expenses. Based upon the economic analyses that EFI has performed utilizing information provided them by their engineers it appears that the economic viability of each of the two New Jersey projects and, therefore, the financability will be greatly stressed due to the increased capital and operating costs associated with SCR unless various contractual arrangements are changed to allow for greater revenue. Another critically important factor, moreover, is the lenders perception of the reliability of the facility with SCR included. If the lender's engineer concludes that SCR technology would cause material reliability problems, then arranging a debt placement becomes much more difficult even if the project economics are enhanced to cover the capital and operating costs.

In conclusion, while we are unable to say with certainty that the addition of SCR technology to these two cogeneration projects would absolutely result in their unfinancability, we do know that if this technology were to be applied to the facilities that the financings at best would be delayed while contractual arrangements were revised and engineering studies were completed.

Thank you for your consideration of this letter and if you have any questions please call us at (212) 510-4240 (Kenneth F. Seplow) or (212) 510-4215 (Louis A. Martarano).

Very truly yours,

Kenneth F. Seplow
Managing Director

Louis A. Martarano
Vice President

envirosphere company

A DIVISION OF EBASCO SERVICES INCORPORATED

160 Chubb Avenue, Lyndhurst, NJ 07071 (201) 460-6500

K. L. KINKELA

October 13, 1986

#163-86

OCT 15 1986

Mr Thomas Micai
NJ Department of Environmental Protection
Bureau of Air Pollution Control - Rm 1110
Labor and Industry Building
John Fitch Plaza
Trenton, NJ 08625

Re: ENERGY FACTORS - KENILWORTH COGENERATION PLANT
PRELIMINARY MODELLING AT THE LEASED PROPERTY LINE

Dear Mr Micai:

As per the request of the NJ DEP that the air quality impacts be estimated at the leased property line rather than the Schering - Plough property line, I am forwarding concentration estimates and the procedures used to obtain these estimates for Dr Janowski's review. Note that the estimated impacts in the transmitted information were calculated based on an assumption that the plume may be entrained in the cavities produced by existing buildings at the Schering plant. Additional modelling is being performed using the ISCST and ISCLT models as agreed to in our October 3rd meeting.

I would appreciate a speedy review of these preliminary results as the project schedule is tighter than originally discussed. Thank you for your consideration in this matter.

Very truly yours,

Frederick B. Pope III

Frederick B Pope III
Supervising Scientist

FBP:mk

cc: T Janowski - NJDEP
T Main - Ebasco
File

*Copy sent to Pico
Weil*

CC J WARREN
3 COPIES TO KUK
PROJECT FILES

105X

EBASCO SERVICES INCORPORATED

160 Chubb Avenue, Lyndhurst, NJ 07071 (201) 480-1900

STEVE PICCO
EBASCO

September 11, 1986

EFKI-PM-071

Mr Thomas A Micai
NJS Department of Environmental Protection
Bureau of Air Pollution Control - Room 1110
Labor and Industry Building
John Fitch Plaza
Trenton, New Jersey 08625

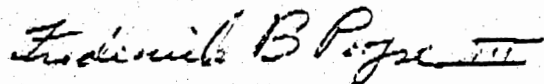
Dear Mr Micai:

Attached is a description of the proposed cogeneration facility to be located in Kenilworth, New Jersey. Included in this description is a discussion of the air quality evaluation approach and modelling protocol. This facility is to be built, owned and operated by EF Kenilworth, Inc., a wholly owned subsidiary of Energy Factors, Incorporated. Ebasco Constructors, Inc. of Lyndhurst, New Jersey will provide turnkey construction of the project including the preparation of the air permit application.

As per our conversation on September 10th, we are awaiting the schedule for the relocation of your agency in order to establish a meeting for discussion of the project.

Thank you for your consideration in this matter.

Very truly yours,



Frederick B Pope III
Environmental Coordinator

FBP/pjr
Attachment

cc: K Kinkela
S Eber
J Koerber - EF
T Weil - EF

TESTIMONY BEFORE THE
NEW JERSEY ASSEMBLY
ENERGY AND NATURAL RESOURCES COMMITTEE
BRUCE L. LEVY, ENERGY INITIATIVES, INC.
APRIL 13, 1987

Energy Initiatives is a subsidiary of Jersey Central Power & Light Company (JCP&L) established to promote the development of cogeneration and small power production throughout New Jersey. Energy Initiatives has experience with the design, implementation and financing of cogeneration projects ranging in size from a small 60 KW system, installed in a senior citizens apartment complex in Lincroft, to a 65 MW system we are installing at a large industrial paper mill located in Elmwood Park. The single greatest impediment we have had to face in the implementation of cogeneration projects is the legislative and regulatory uncertainty that exists in New Jersey.

In developing a cogeneration project of any type, many factors must be considered, including fuel supply, electric interconnection, state and local permitting, financing, contracting and installation. Various efforts have been made by New Jersey legislators, regulators and other government agencies to improve cogeneration project economics and simplify the steps required to cogenerate. These efforts include exemption of cogeneration equipment from state sales tax; exemption of

natural gas used in cogeneration from the Gross Receipts and Franchise Tax; issuance of tariffs by gas utilities for special gas rates; issuance of tariffs by electric utilities specifying interconnection requirements, standby charges and pricing schedules for the utility purchase of excess power; and the proposed issuance of environmental guidelines for emission restrictions.

These efforts have aided small scale cogeneration by defining the environment in which cogeneration must function and by providing sufficient support for many small scale cogeneration projects to proceed. This is evidenced by the many successful small cogeneration applications in hospitals, YMCAs and apartment buildings. Generally, medium and large scale cogeneration projects must be developed and operated in a slightly different environment, thus altering the "defined environment" of cogeneration project development.

The main differences being 1) large projects depend upon the sale of some electricity to the utility; 2) these cogeneration units, due to their large size, are subject to more intense scrutiny by the DEP and may have to meet stringent requirements for air emissions, lastly, 3) these facilities usually require the construction of new buildings or extensions, to the existing facility, thereby requiring the approval of local planning boards.

I would like to review the circumstances surrounding these issues and why it has inhibited the growth of cogeneration.

It has been agreed upon by utilities and regulators, alike, that long-term utility buyback contracts are necessary to support cogeneration development. Despite this, in the past two years, such contracts have been available for only about five months (two months in 1985 and three in 1986).

In the meantime, potential cogeneration projects wait and anticipate when, and at what price, future power purchase contracts will become available. This is a result of the extended utility/regulatory negotiations prior to issuance of purchase offers and the almost immediate subscription to these offers, which occurs due to the lack of controls over these contracts. One such control which would slow the subscription and close out of these offers would be to require a limit on contract size to prevent five or six oversized projects from closing out future offers, as they have in the past.

Previously, purchase offers have been open for only two or three months, a time period which is completely inadequate for the reaction and response of the operating companies, which represent the heart of New Jersey's industrial base.

Of the three or four operating companies lucky enough to obtain a contract in the JCP&L 1985 offer, all were located

in Public Service Electric & Gas Company's (PSE&G) territory. As such, the excess electric power generated by a cogeneration plant would have to be wheeled to JCP&L.

As many here today might know, due to the intervention by regulators and other state agencies the determination of PSE&G's wheeling policy and pricing schedule was delayed nearly ten months. Some projects, which received power sales contracts in November 1985, are just now able to negotiate wheeling contracts.

The second area of concern which larger projects must face is the stringent treatment of emissions by the DEP. I will limit my remarks on this issue since much discussion has already taken place at other public forums. Suffice it to say, "Cogeneration cannot withstand DEP efforts to limit emissions on new energy sources to compensate for what is perceived as excess emissions from existing sources."

Imposition of excessive emission control requirements by the DEP can severely cripple the economic health of any viable cogeneration project. I believe, however, that, in this area, logic may prevail; and, the DEP's final guidelines will reflect a softening of their earlier position. If this does occur, it should be noted that it was only as a result of many months of lobbying and negotiation, a process which held up issuance of several air quality permits by nearly one year.

The final area I would like to discuss is that of local planning boards. These bodies, established to protect the safety and environment of the many towns which make up New Jersey, can often delay, and even extinguish, a cogeneration project. While some townships are reasonable in the execution of their responsibilities, others can be uncooperative and anti-industry, trying their best to discourage cogeneration projects of any type. The problem lies in the fact that most cogeneration installations require variances from local ordinances due to the building height, lot coverage or, in the worst case, permitted use. Requests for variances are almost always viewed as forerunners of certain destruction to the local environment. Despite presentation of expert witnesses to review technology, safety and impact on the town, planning boards almost always decide cases based on emotion and political pressure. These issues would only be complicated by any sort of real estate tax exemption on cogeneration facilities. In many cases, these same emotions govern town boards where no variances are sought. Operating companies are given the impression that cogeneration is not wanted in many towns. Most of the experience I refer to is with clean, gas-fired site plans. Efforts by my Company to consider coal-fired facilities have been treated with such hostility, that site plan approval requests are often withdrawn or never submitted.

As you can see, cogeneration projects, despite their generally accepted economic and environmental benefits, face

many challenges with the current state and local regulatory situation. Many problems are due to fear and mistrust; mistrust that utilities will pay too much or too little for power, charge excessive wheeling rates, or that cogenerators will pollute the environment or be an unpleasant neighbor.

I believe many of the laws and regulations that already exist safeguard against potential abuses. It is necessary to deal with conflicting jurisdictions and other conflicts which lead to delay and an unknown environment for cogenerators.

Nixon, Hargrave, Devans & Doyle

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STATEMENT OF SCOTT M. TURNER
BEFORE THE
ASSEMBLY ENERGY AND NATURAL RESOURCES COMMITTEE
Assemblyperson Maureen Ogden, Chair

Newark, New Jersey
April 13, 1987

Madam Chair, my name is Scott M. Turner. I am a partner in the law firm of Nixon, Hargrave, Devans & Doyle which is based in Washington, D.C., New York City, Rochester and Albany, New York, and Palm Beach County, Florida. I appear on behalf of The Independent Energy Association of New Jersey, Inc. The Association, formed earlier this year under the New Jersey Nonprofit Corporation Act, was organized (a) to conduct research, publish reports, conduct seminars and workshops and hold conferences related to the concept of cogeneration and small power production, (b) to disseminate information and promote the advancement of independent energy, and (c) to provide a forum for the exchange of technological ideas and concepts and economic analyses that benefit all users and potential users of independent energy.

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Because I and several other lawyers from our firm's Environmental Department were actively involved in the events leading to the determination by a California air pollution control district that selective catalytic reduction ("SCR") constituted the equivalent of "lowest achievable emission rate" ("LAER") for two gas turbine applications in 1984, the Association asked me to share with you our perceptions on that process and its outcome. Our involvement during 1984 was on behalf of a third-party cogeneration developer and included extensive discussions among EPA Region IX, the California Air Resources Board, and local air pollution control districts with respect to a variety of air pollution control issues posed by cogeneration development in California.

Because the SCR phenomenon was spawned in the South Coast Air Quality Management District ("SCAQMD"), it is important to understand the political situation in California generally, and in the Los Angeles area specifically, during 1984. At that time, the SCAQMD was under intense pressure from EPA Region IX to come to grips with NO_x reduction in the South Coast air basin. As you know, that basin is the principal and most notorious nitrogen dioxide nonattainment area in the United States.

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Compounding EPA's perception that the South Coast District was not proceeding vigorously on this issue was the existence of the so-called Baker Bill. The Baker Bill, a California law, required air pollution control districts themselves to create offsets for cogeneration and certain other types of facilities located in nonattainment areas if the facilities did not have sufficient internal offsets to fully offset new emissions. Consequently, Region IX was pressing the SCAQMD on its NO_x attainment planning efforts and moving aggressively to disapprove that portion of the District's regulations which implemented the Baker Bill because the District had been unable to provide offsets (i.e., through a growth allowance) for new cogeneration facilities which were not providing their own.

By mid-summer 1984, the pressure on the SCAQMD had mounted to the point that SCR, coming from virtually out of nowhere, was seized upon by the District as the vehicle to demonstrate action and seriousness of purpose to EPA Region IX. That the SCAQMD was under intense pressure indeed was demonstrated by the rapidity and the nature of the process by which SCR was determined to be LAER for two cogeneration projects in August 1984 as well as by the data base on which the determination was made.

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As to one of these projects, the SCAQMD denied the permit application on the very last day of its statutory 180-day review period, after having issued a draft permit for the project without SCR thirty days earlier.

The eleventh-hour denial of these two projects' permits for failure to install SCR, and the threatened imposition of SCR on future cogeneration projects, occurred despite the fact that potential NO_x emissions from cogeneration projects then in the planning stage were small relative to total NO_x emissions in the basin. The only plausible explanation for the District's action was its perception that the cogeneration industry was an industry against whom fast and aggressive action could be taken because it was new and relatively vulnerable.

As to the SCAQMD decision itself, our California client's expert, Radian Corporation, concluded after reviewing the report on which the determination was based that the District (1) had relied on too limited a data set, (2) had erred in relying almost exclusively on vendor data, and (3) had ignored the experiences of other SCR source applications and allowed key technical questions to go unanswered.

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The District report had been prepared by Robert Pease, a young engineer who made a hurried one-week trip to Japan in early July 1984. In essence, the Pease Report (copy attached) is a report of his trip to Japan, regurgitating without critical analysis information which he was supplied by several Japanese SCR vendors. Mr. Pease was accompanied throughout the trip by the ever-present vendors, and virtually all Mr. Pease's discussions in Japan were conducted through translators. Mr. Pease spent only two to three hours at the plant which is central to his report and which at the time was the only operating gas turbine in the world with SCR. Under the difficult circumstances posed by the language barrier and the shortness of his visit, Mr. Pease, not surprisingly, came away with key questions unanswered. Consequently, the Pease Report should be viewed for what it is -- a trip report, not an analysis of a technology that could serve as an underpinning of a technical determination that SCR was LAER for any particular application.

Because the Pease Report nonetheless was utilized by the SCAQMD as its basis for denying the two cogeneration projects' permit applications a mere month

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after Mr. Pease returned from Japan, I will address the report's deficiencies in some detail. Radian's critique of the Pease Report and the SCAQMD decision-making process cited the danger which exclusive reliance on vendor data poses in technology determinations of this nature. Vendors, after all, are out to make a sale. That is not to say that there is nothing to be learned from vendor information; it must, however, be recognized for what it is, and regulatory agencies must also obtain data from SCR users and researchers as well. The SCAQMD did not do that.

Radian also identified the "technology transfer" issue as one that had not been adequately addressed by the SCAQMD. Except for the one operating gas turbine, Mr. Pease's report focused on the Japanese experience with SCR on units other than gas turbines, and took the great leap of faith that SCR could be transferred readily to smaller cogeneration gas turbines. However, in transferring SCR technology from Japan to a variety of applications in the United States, the overall experience has not been satisfactory. Five years of experience in Southern California with SCR on lean burn internal combustion engines has revealed catalyst performance concerns and ammonia controller problems. Controller

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problems also were encountered on the one SCR application to a gas/oil-fired utility boiler in the United States. Similar experiences have been encountered in SCR applications at coal-fired utility boilers in the United States, even though the Japanese are reported to have several full-scale coal plants with SCR.

Other technical issues which the SCAQMD did not address in any meaningful way include the effect of SCR-created backpressure on a gas turbine, the impact of fuel oil use on catalyst performance, and ammonia handling, storage, and emissions issues. The ammonia issues involve the potential for significant environmental impact and thus should be of particular concern to the Department of Environmental Protection ("DEP").

To date, SCR has not been incorporated by rulemaking into the SCAQMD air pollution regulations applicable to new or existing gas turbines. While the SCAQMD staff is presently considering making a proposal to the District Board in that regard, any staff proposal will undergo formal rulemaking following the completion of an Environmental Impact Review. It is important to recognize that the application of SCR by the SCAQMD to those two

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cogeneration projects in 1984 was to satisfy the District's so-called Best Available Control Technology ("BACT") requirement, which is equivalent to the federal LAER requirement for new sources in nonattainment areas. Thus, BACT in California is really LAER, not the BACT that EPA and DEP would apply to sources which are subject to prevention of significant deterioration ("PSD") review. Interestingly (and confusingly), LAER is called BACT throughout California and is applied to major new sources in both nonattainment and attainment areas. To the extent that other California districts have permitted cogeneration projects with SCR, they have done so as the result of California's peculiar BACT definition and not as the result of any independent technical investigation or analysis.

Much of the testimony presented at the January 22 workshop/hearing demonstrates that the questions raised before the SCAQMD persist. Limited SCR data continues to be a problem. Experience with SCR applications in the United States has not increased significantly since 1984. What little experience there has been certainly has produced mixed results. Catalyst performance, especially on oil, and catalyst disposal considerations and ammonia

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storage and emission concerns continue to loom large, especially in the face of the new strictures imposed by Title III of the Superfund Amendments and Reauthorization Act. Finally, financibility considerations continue to suggest that most, if not all, projects cannot survive the costs and risks imposed by an SCR requirement, as suggested by numerous speakers on January 22, including representatives from Hoffman-LaRoche, Energy Initiatives, Energy Factors, GE, and Mobil Oil.

The political and technical imperatives at work in Southern California in 1984 are not evident in New Jersey in 1987. New Jersey has attained the NO_2 national ambient air quality standard, and, while ozone continues to be troublesome, the role of NO_x in ozone formation is not well-enough defined to serve as a basis for imposing an SCR requirement on cogeneration sources in New Jersey. Furthermore, the contribution of existing and and planned cogeneration sources to total NO_x levels in New Jersey is so insignificant, both in absolute and relative terms, that the imposition of stringent controls would not produce significant air quality benefits even if NO_x 's role in ozone formation were sufficiently understood. In this regard, recall Mr. Heaton's statement

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earlier today that the 6000 tons of NO_x per year from cogeneration cited by Mr. Berkowitz is dwarfed by the 460,000 tons of NO_x per year generated by other sources.

The Independent Energy Association of New Jersey applauds the State's apparent determination to examine the issue of appropriate NO_x control strategies in a deliberative fashion, with consideration given to all sides of the issue. The proposal outlined by DEP's Jorge Berkowitz today is certainly a better approach to the issue than an immediately effective, across-the-board SCR requirement, which was where DEP was headed prior to the January 22 workshop/hearing. In particular, the Association is encouraged by DEP's decision to approach the issue by establishing three distinct cogeneration source categories based on unit size.

Make no mistake, however; SCR remains a critical part of DEP's approach, whether it is required today or in 1992. Accordingly, the premises on which DEP has proposed to mandate SCR must be placed on the table for all concerned parties to examine. First, DEP must be called upon to explain the implication in Mr. Berkowitz's statement today that planned cogeneration projects would

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emit major amounts of NO_x relative to other existing or proposed NO_x sources in light of the numbers advanced by Mr. Heaton. Likewise, DEP must be required to justify, if it can, its conclusion that NO_x is a primary cause of ozone nonattainment in New Jersey. How, for example, does DEP believe the role of NO_x in ozone formation compares to the role of hydrocarbons? Other urbanized states with ozone nonattainment problems, such as New York, Illinois, and Florida, are not embracing SCR for NO_x control for ozone reduction. Instead, those states continue to impose the federal new source performance standards ("NSPS") as BACT for gas turbines. Finally, DEP's proposed conclusion that a 25 ppm level is achievable by 1992 on mid-range cogeneration facilities must be subjected to further scrutiny. How is it that, if SCR is not achievable now on such units, as DEP has concluded, DEP can say that it will be available in 1992 with such certainty? And to the extent that DEP believes that other technologies will be available in 1992, it will not be possible, I submit, for today's projects to be designed and constructed to incorporate an as yet unidentified technology.

These and other issues raised by the speakers who proceeded me need to be examined in a process which, at a

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minimum, includes further refinement of DEP's proposed approach, the release to the public of the data on which DEP would base that proposal, and an opportunity for public review and dialogue on the proposal. That process obviously will be time-consuming. However, in the absence of political and technical imperatives such as those which drove the rapid embrace of SCR in California, New Jersey need not rush to judgment on the SCR issue.

Must public examination of DEP's key assumptions and its proposal occur in a formal rulemaking setting? From a practical standpoint, that may not be necessary, as evidenced by the apparent success of the January 22 workshop/hearing in adducing information which led to the refining of DEP's initial approach to the issue. DEP apparently is discomforted by the prospect of a formal rulemaking. We today heard Mr. Berkowitz threaten that, if DEP had to develop emission limitations as regulations, those limitations would be made retroactive on pending permit applications. This surprising statement is not based on any legal requirement and certainly is inconsistent with Mr. Berkowitz's earlier stated belief that "grandfathering" would be appropriate for a variety of reasons under DEP less formal "guideline" approach. As

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for his contention that regulations do not provide the flexibility embodied in guidelines, one need only note that many regulations contain variance procedures to provide exactly that flexibility.

Whatever the process, however, it is imperative while it unfolds that DEP address a related issue which was raised by several speakers at the January 22 workshop/hearing and again today -- that DEP's review of specific cogeneration projects has trapped a number of project sponsors in the "shifting sands" of changing and inconsistent approaches to an appropriate emissions limitation. Pending the outcome of those deliberations, DEP must continue processing cogeneration permits which are in the pipeline in an equitable and expeditious manner.

In conclusion, considerable progress has been made since January 22. DEP is to be commended for its willingness to listen to and analyze the information which has been submitted. The Independent Energy Association of New Jersey is prepared to work closely with the State as these complex and interrelated issues of environmental protection, energy planning and economic development are further evaluated and balanced.

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Thank you very much for the opportunity to appear
before the Committee.

Power NorthEast
Marketing Corporation

April 17, 1987

New Jersey State Legislature Assembly
Energy and Natural Resources Committee
State House Annex, CN-068
Trenton, New Jersey 08625

Attention: Assemblywoman Maureen Ogden

Reference: Cogeneration
Impediments to Cogeneration
Hearing of April 13, 1987, Newark, New Jersey

Dear Assemblywoman:

We thank you for holding the hearing in Newark, April 13, on Impediments to Cogeneration in New Jersey.

Power NorthEast is a representative of a major electric power oriented architect-engineering firm and as such we have been involved in various cogeneration projects in New Jersey.

During your hearing, two New Jersey electric power companies expressed opposition to self-help electric power wheeling, purporting it to being against the public interest. We at Power NorthEast disagree:

- * A company willing to operate a number of relatively small manufacturing plants rather than a single large plant should be encouraged, not penalized. Very small cogeneration plants ($\frac{1}{2}$ to two or three megawatts) are most often uneconomic if only because of manning requirements which are as great and as expensive as for 10, 20, or 60 mWe plants.
- * Current management thinking is that small plants are more personal and enjoyable for the employees and more productive.
- * Small plants can survive in areas with small labor pools many of which are in regions of high unemployment.
- * Commuting by employees to small plants in rural and outlying suburban locations may reduce rush hour congestion on major arteries.

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Power NorthEast
Marketing Corporation

Assemblywoman Maureen Ogden
New Jersey State Legislature Assembly

April 17, 1987
Page 2

- * Connecticut is a competitor to New Jersey for business; Connecticut allows self-help wheeling.
- * Power generated in an urban plant and transmitted to suburban plants will probably reduce power flow in transmission lines since it will be counterflow.
- * Electric power used by an urban or near-urban plant will probably come from outlying areas whether from a utility or from a cogeneration plant. Transmission lines would not be burdened with extra load just because the electricity flow is from a cogeneration plant.
- * Finally, electricity is not allowed to be transmitted across a public road except by a utility. The owner of property on both sides of a road should be allowed to transmit power across that road.

We fail to see any redeeming public benefit in the electric utilities unilateral decision to disallow self-help wheeling.

Very truly yours,

POWER NORTHEAST MARKETING CORP.

Walter Van Winckel
Walter VanWinckel

WV:jk

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THOMAS P. FOY
GENERAL COUNSEL



"The world is divided into those who want to become someone and those who want to accomplish something. There is less competition in the second category."

Jean Monnett 1888-19

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TESTIMONY
of
NEW JERSEY STATE AFL-CIO
before the
ASSEMBLY ENERGY AND NATURAL RESOURCES COMMITTEE
APRIL 13, 1987

It is no secret that New Jersey's energy costs are "unacceptably high" and that high energy prices have hurt industries' ability to compete with their counterparts in other states. The cost of energy in New Jersey is a critical negative factor in encouraging industries to locate in our state. Cogeneration, however, if encouraged and allowed to flourish without impediments, can substantially improve the State's economic climate and help keep and encourage old and new industries to move to or remain in New Jersey.

Frost and Sullivan recently released a market research report that estimates that between now and the year 2000 outlays for cogeneration systems, related equipment and services will be \$60 billion dollars. The figure for the next 2-3 years is \$10-12 billion. Because of New Jersey's substantial, but fading industrial base, much of this cogeneration being developed is right here in our state where there is desperate need.

The decentralized nature of cogeneration gives it the potential to create thousands of new jobs. The New Jersey Department of Labor's Division of Planning and Research, estimates that constructing 500 Megawatts (MW) of cogeneration would create 7,500-10,000 construction jobs; plus an additional 9,700-10,000 indirect jobs in trucking, manufacturing and support services.

There is no comparison between the number of jobs created by decentralized cogeneration systems and a centralized nuclear or coal plant. A nuclear power plant or coal plant producing 1000 MW would only add a fraction of the jobs cogeneration systems totaling 1000 MW would add.

An additional example of the numbers of jobs created by centralized energy systems is provided by Dartmouth College's Resource Policy Center. The Coalition of Northeastern Governors hired Dartmouth to do a study of the economic impacts of wood energy in the northeast for 1985. The 6 New England states, New York, New Jersey, Pennsylvania and Delaware were studied. Looking only at wood energy in the industrial sector, the number of total net jobs created in 1985, was about 3100. These jobs were created by using an alternate fuel that is not widely used throughout the northeast, especially in the industrial sector, yet the number of jobs created was still significant. Using a fuel as prevalent as natural gas, for example, will increase the number of jobs many times over the figure for industrial wood energy.

Cogeneration makes sense for New Jersey. It will help keep industries competitive by reducing costs and enable them to keep their operations in state, thus preserving jobs and creating new ones. It will provide the utilities with the reliable source of power they need.

to prevent a shortfall. It will keep the environment clean and in some cases, where fuel oil is replaced by natural gas, will actually improve the air quality. Cogeneration is a positive thing.

However, there are a number of impediments to cogeneration such as: access to natural gas; unreasonable environmental regulations; unreasonable standby power rates and unreasonable wheeling rates. The Legislature should support New Jersey's cogeneration industry by passing various pieces of legislation to accomplish the following: facilitate access to natural gas; ensure that all environmental regulations are fair and reasonable and that all cogeneration permit processing is done in a timely fashion; and require the utilities to provide reasonable standby and wheeling rates.

Job producing industries are the backbone of New Jersey's economy. We urge this committee to draft legislation that assists the cogeneration industry in the State.

